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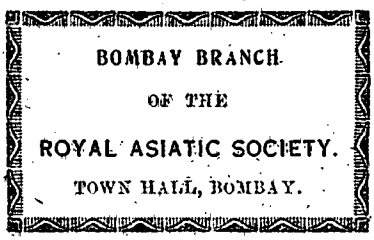

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ANNUAL REPORT

OF THE

Indian Central Cotton Committee

FOR THE

YEAR ENDING 31st AUGUST

1938.

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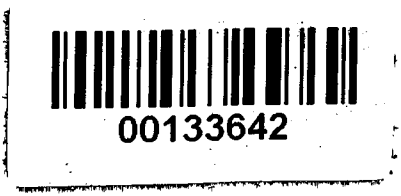

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ANNUAL REPORT OF THE INDIAN CENTRAL COTTON COMMITTEE FOR THE YEAR ENDING 31st AUGUST 1938.

CHAPTER I.

THE Indian Central Cotton Committee was constituted by the Government of India in the Department of Revenue and Agriculture, in their Resolution No. 404-22, dated the 31st March 1921, as a result of one of the recommendations of the Indian Cotton Committee of 1917-18. Originally the Committee was purely an advisory body, but with its incorporation under the Indian Cotton Cess Act in 1923, it became an administrative body having at its disposal funds "for the improvement and development of the growing, marketing and manufacture of cotton in India." The activities of the Committee now extend to all branches of cotton improvement in India, and as an authoritative body to advise the Central and Provincial Governments on important matters of cotton policy, it has attained an outstanding position. The Committee provides funds for research into cotton problems of all-India importance and for the development, extension and marketing of improved varieties of cotton. It should be stated, however, that the aim has always been to supplement and not supplant the work of the Agricultural Departments in the cotton growing provinces and Indian States. Though, as a matter of convenience, the Committee has laid down certain lines of demarcation regarding the investigations which it considers appropriate for its grants, the general policy is to give assistance in the directions where it is most needed in the carrying out of a co-ordinated policy of cotton improvement. For a considerable period the grants made were restricted to agricultural research, but in 1929 it was decided that the time had come to add support to the efforts already being made, to bridge the gap between the experiment station and the cultivator and to supplement the funds which the Agricultural Departments were devoting to the introduction of improvements into agricultural practice. Special attention has since been devoted to seed distribution schemes.

The Committee has not stopped at the production of better cotton, but from its inception has paid a good deal of attention to better marketing, to the prevention of adulteration and other abuses and to many other problems connected with the cotton trade of the country. Including as it does representatives of growers, agricultural officers, traders, spinners and manufacturers, it constitutes an invaluable forum for the discussion of many problems of general concern. The ever-increasing understanding which has arisen from the association of leading commercial representatives with growers and research workers had led to developments which at one time seemed difficult to

achieve, whilst the readiness with which trade associations, particularly the East India Cotton Association, have taken action on recommendations designed to benefit the cotton grower has made the task of the Committee much easier. Much of the success, however, has been due to the way in which the leaders of the commercial community have given freely of their time and knowledge to the Committee's work and to its day-by-day administration. Whilst the Committee's constitution ensures a broad outlook on the many problems affecting the cotton industry, its primary concern is the interst and welfare of the cotton grower.

PERSONNEL.

2. A list of the members constituting the Committee and the various interests they represent as on 31st August 1938 is given in *Appendix I.* Under the Indian Cotton Cess Rules, members (excluding *ex-officio* members) hold office for three years, and one-third of their number retire annually in rotation. The term of office of additional members appointed by the Governor-General-in-Council under Section 4 (xi) of the Indian Cotton Cess Act is three years or such lesser period as may be specified in the notification of appointment.

SUB-COMMITTEES.

3. Most of the detailed work of the Committee is carried on through Sub-Committees—an arrangement which not only effects a considerable saving of time, but also lightens the task of the Committee at its half-yearly meetings. The Committee is greatly indebted to the members of the various Sub-Committees for their invaluable assistance and willing co-operation in furthering the work for which it is responsible, more particularly are its thanks due to the members of the Standing Finance and Local Sub-Committees who are required to meet at frequent intervals to deal with urgent business of the Committee.

The functions of the various Sub-Committes are detailed below, and their composition as on the 31st August 1938 will be found in *Appendix II.*

(*a*) *Agricultural Research Sub-Committee.*—As its name implies, this Sub-Committee is concerned with matters relating to research and extension schemes financed by the Committee. It reports on the progress made on research and seed distribution schemes, examines proposals for new schemes or for extension of old schemes, and also considers the progress made and the work done by the Committee's research students. This Sub-Committee ordinarily assembles half-yearly, a day or so before the meetings of the full Committee.

(*b*) *The Standing Finance Sub-Committee* comprising nine members is a statutory Sub-Committee and is the principal executive body of the Committee. By a resolution of the Committee one of the members of this Sub-Committee must be a representative of cotton growers. The Committee has

also decided that one of the members should be an Agricultural Officer. All matters involving finance are dealt with by this Sub-Committee. Eight meetings of this Sub-Committee were held during the year under review.

(*c*) *The Local Sub-Committee* is concerned largely with matters of a general nature not involving finance which cannot be postponed for consideration to the usual half-yearly meetings of the full Committee. Eight meetings of this Sub-Committee were held during the past year.

(*d*) *The Cotton Ginning and Pressing Factories Sub-Committee* is appointed by statute to attend to matters arising out of the Cotton Ginning and Pressing Factories Act of 1925. During the year under report there was no occasion for this Sub-Committee to meet, as the routine work belonging to it was disposed of by the Local Sub-Committee.

(*e*) *The Technological Research Sub-Committee* deals with matters relating to technological research and the work done at the Technological Laboratory, and generally meets during the time of the half-yearly meetings of the full Committee.

(*f*) *The Cotton Forecast Improvement Sub-Committee* usually meets half-yearly, its principal business being the improvement of the accuracy of cotton forecasts of India.

(*g*) *Wider Markets Sub-Committee.*—This Committee was constituted in 1933 with the object of examining the possibilities of finding wider markets for Indian cotton. Two meetings of this Sub-Committee were held during the year.

(*h*) *The Standards Sub-Committee,* which was constituted in April 1933, is concerned with the preparation for use in India of universal standards of certain growths of cotton dealt with in common both by the East India Cotton Association, Bombay, and the Karachi Cotton Association, and of certain other varieties with which only the former Association is concerned. Five meetings of this Sub-Committee were held during the year.

(*i*) *The Research Students Selection Sub-Committee* selects students to whom scholarships or training grants are awarded for the purpose of undergoing training in research in the several sciences relating to cotton. Two meetings of this Sub-Committee were held during the past year.

In addition to the above, Special Sub-Committees are appointed from time to time to deal with specific matters which do not directly fall within the purview of any of the other Sub-Committees. One such Sub-Committee was appointed during the year to examine the publicity and propaganda activities of the Committee.

REPRESENTATION ON OTHER BODIES.

4. The following members represented the Committee on the Board of Governors of the Institute of Plant Industry, Indore, during the year under review :—

The President,
Sir Chunilal V. Mehta (*Vice-President*),
Sir Purshotamdas Thakurdas,
Mr. S. D. Saklatvala,
Mr. Kasturbhai Lalbhai,
Mr. J. Vonesch,
Mr. M. S. Durutti,
Rao Bahadur Sir Madhaorao Deshpande,
Sardar Rao Bahadur Bhimbhai Ranchodji Naik,
Mr. Chandulal P. Parikh,
Mr. Chellaram Shewaram,
Sir William Roberts, and
The Secretary.

Rao Bahadur Sir Madhaorao Deshpande represented the Committee on the Imperial Council of Agricultural Research and Mr. M. P. Kolhe, Mian Nurullah and Sardar Rao Bahadur Bhimbhai Ranchodji Naik on the Board of Directors of the East India Cotton Assoiciaton.

The Committee is an Associate Member of the International Federation of Master Cotton Spinners' and Manufacturers' Associations.

MEETINGS.

5. Two meetings of the Indian Central Cotton Committee were held during the year, one on the 25th and 26th January and the other on the 12th and 13th July 1938. Both these meetings were held in Bombay, and amongst those present at the first meeting by invitation were the Hon'ble Mr. Morarji R. Desai, Minister for Revenue and Agriculture, Government of Bombay, Dr. T. E. Gregory, Economic Adviser to the Government of India and Mr. A. M. Livingstone, Agricultural Marketing Adviser to the Government of India.

A list of the more important resolutions passed at the above meetings will be found in *Appendix III*.

PROVINCIAL COTTON COMMITTEES.

6. The value of the Provincial Cotton Committees in dealing with problems of provincial importance has been stressed in previous reports, and where such Committees have been actively functioning the work done by them has been of material benefit not only to the Provincial Departments of Agriculture but also to the Committee. Local problems can be visualised best by those

on the spot, and from this point of view the discussions of Provincial Committees are of considerable assistance to the Indian Central Cotton Committee, particularly in arriving at decisions on matters of a provincial character.

ADMINISTRATION.

7. Mr. D. N. Mahta assumed charge as Secretary of the Committee on the 4th October 1937. Mr. C. J. Bocarro continued as Assistant Secretary throughout the year save for a short period of about one month, *i.e.*, up to 4th October, during which he held charge of the current duties of the office of the Secretary in addition to his own duties. Mr. Ajodhya Sahai, First Assistant, was appointed to the post of Superintendent in the Secretary's Office on probation for one year with effect from the 9th June 1938. The entire staff worked loyally and evinced great zeal and interest in the performance of their duties throughout the year. Dr. Nazir Ahmad, Director of the Committee's Technological Laboratory, was granted leave from the 9th May to the 11th June, Mr. D. L. Sen, Senior Research Assistant, officiating as Director.

WORK OF THE YEAR.

8. The year under review has been one of steady progress in every department of the Committee's activities. A brief account of the work done during the year is given in the following chapters under :

Research,

Seed Distribution and Extension Schemes,

Statistics, and

General.

CHAPTER II.

RESEARCH.

9. The research policy of the Committee is carried out in two ways, *viz.*, by the grant of subsidies to Departments of Agriculture in Provinces and States for specific investigations on cotton and by direct control of the Technological Laboratory at Matunga, Bombay. In addition, the Committee contributes a large sum of money every year to the Institute of Plant Industry, Indore, where problems of fundamental, economic and agricultural importance are investigated. The research schemes in progress in Provinces and States include botanical for breeding high yielding superior types of cotton, entomological for the study of the life-history of certain cotton pests and measures to combat them, mycological for ascertaining ways and means to prevent loss due to fungoid diseases and physiological for the investigation of crop growth and causes of bud and boll shedding. All schemes before being approved are thoroughly examined by Special Sub-Committees consisting of the expert members of the Committee and others specially co-opted because of their scientific qualifications. Close touch is maintained with the work being done under the various schemes by means of progress reports and programmes of work which officers in charge of schemes are required to furnish annually and which are critically examined by Special Sub-Committees. The Committee also gives grants to Agricultural Departments and Co-operative Sale Societies for the extension and marketing of improved varieties of cotton and the maintenance of nuclei of pure seed of approved strains. Besides, scholarships and training grants are sanctioned for post-graduate training in India and abroad in subjects pertaining to various aspects of cotton. During the past few years, the Committee collaborated with the Imperial Council of Agricultural Research in the scheme for investigating the cost of cultivation of cotton, sugarcane and their rotation crops in the principal cotton and sugarcane growing areas of India.

During the year under report, 38 research schemes, 14 seed extension and marketing schemes and Four nuclei schemes were sanctioned at a total estimated cost of Rs. 6,39,495. In addition, a sum of Rs. 3,22,780 was sanctioned for the Technological Laboratory, Matunga, the Institute of Plant Industry, Indore, and the economic inquiry into the cost of cultivation of cotton, sugarcane and their rotation crops.

TECHNOLOGICAL LABORATORY.

10. The annual report of the Committee's Technological Laboratory at Matunga is now issued as a separate publication. The Report for the year ending 31st May 1938 has already been published. The resources of the Laboratory continue to be availed of by agricultural officers for assessing the

spinning value of their new strains and by mills for testing their samples and for investigating technical problems. Samples are tested under the following groups :—(*a*) agricultural samples, (*b*) samples of Standard Indian cottons, (*c*) trade samples and (*d*) technological samples. (*a*) Agricultural samples represent either new or improved varieties under trial by Agricultural Departments, or old types grown in connection with certain field experiments. (*b*) The standard cottons mostly represent improved varieties grown on a commercial scale ; during the period under review, tests were completed on :—*Punjab-American* 289*F*, *Verum* 262 (*Nagpur*), *Verum* 262 (*Akola*), *V.* 434 (*Akola*), *Late Verum* (*Nagpur*), *Umri Bani*, *Sind Sudhar* and *Punjab-American* 4*F* and the results published in circulars, as usual. (*c*) The trade samples tested fall under two heads :—(*i*) those supplied by the East India Cotton Association representing the fair average quality of different varieties of Indian cotton which form the bulk of the cotton crop ; and (*ii*) those supplied under arrangement with the Bombay and Ahmedabad Millowners' Associations representing the early arrivals of the various Indian cottons into the local markets. Altogether 25 samples of the first category and 20 of the second were tested during the year and the results published in circulars which were distributed to the trade and industry in this country and abroad. In addition to these tests, samples received from individual mills and firms were also tested, as in the past, on payment of the prescribed fees. The total number of samples received for test during the period under review amounted to 118 of which 12 were for spinning tests, 26 for fibre tests, 37 for yarn tests, 20 for moisture tests, and 23 for cloth tests. (*d*) Technological samples comprise samples of cotton which are tested at the Laboratory in connection with certain research problems. Investigations of interest to the trade completed during the year under this head were (1) effect of employing different degrees of compression in a bale on the fibre properties and spinning quality of cotton ; (2) optimum drafts in the fly frames ; (3) suitability of two cottons for purposes of mill mixings in relation to their fibre characters ; (4) empirical relationships between count, lea strength and staple length of Indian cottons ; (5) effect of humidity on the spinning performance of Indian cottons ; (6) draw-frame speed tests ; (7) effect of storage on the quality of Indian cottons ; (8) deterioration of *B. D.* 8 cotton with lapse of time and (9) quality of lint in relation to ginning factors.

INSTITUTE OF PLANT INDUSTRY, INDORE.

11. The Annual Progress Report of the Institute of Plant Industry, Indore, for the year ended 31st May 1938, is summarised in *Appendix IV*. The primary object of the Committee in financing this Institute, which was established in 1924, is to provide a central research station for cotton in the black soil area of the Malwa Plateau. The programme of work includes the general botany, physiology and genetics of Indian cottons and, in addition, a number of agricultural investigations connected with the cultivation of cotton and other crops are also carried out. The Institute is maintained by annual contributions from the Committee on the one hand and the Member States in Central India and Rajputana on the other, and representation on the

Governing Body of the Institute in any one financial year is proportionate to the grants made by them during the previous financial year. During the year 1937-38, the contributions of the Committee to the Institute amounted to Rs. 1,11,000 against Rs. 41,850 of the Member States, and accordingly the Committee was represented on the Governing Body by thirteen members against five of the States.

GRANTS-IN-AID.

SCHEMES IN PROGRESS IN PROVINCES AND STATES.

MADRAS.

12. *Madras Herbaceum Scheme.*—This is one of the earliest schemes which was sanctioned by the Committee in 1923. Its original object was to secure a suitable *Uppam* (*g. herbaceum*) strain capable of spinning over 20's to replace *Karunganni* (*G. Indicum*) in the 'Salems and Tinnevellies' tracts where, due to low and precarious rainfall, *Uppam*, a more hardy variety than *Karunganni*, gives better yield than the latter in adverse seasons, though the reverse is the case in years of good rainfall. The difficulty of obtaining suitable *Uppam* strains by unit selection was realised in 1930 and it was then decided to resort to hybridisation. One of the hybrid strains, *viz.*, 4714, which was found promising under district trials, showed that though it was quite suitable for the regions north of Virudunagar, it did not do well in the area south of it. It also suffered in yield by the presence of some sterile plants. During 1936-37, promising material was secured, combining yield, ginning percentage and staple length. Tests were made and eight selections, including No. 4714, and one of its broad-lobed mutants gave more than 30 per cent. increase over the control *K.P.T.I.* A large number of single plant cultures possessing lint length above 24 mm. and ginning outturn above 31 per cent. were tested for yield in replicated plots. Of these, 31 were found significantly better than the control. One hundred and ninety-one single plants with desired combinations of lint length and ginning percentage have been selected from direct and back-crossed population for yield tests. During the year under review the strains were tested on the Agricultural Research Station, Koilpatti, and on cultivators' lands in Coimbatore, Madura, Ramnad and Tinnevelly districts; but with the exception of three, the rest could not be grown at the places chosen for want of sufficient seed. No. 4714, however, did uniformly well in all the centres except Koilpatti. Two of the strains (*C.* 6-3 and *L.* 3.4/4) were tried under irrigation at Coimbatore during the cold weather and at Srivilliputhur during summer. With only two waterings, one of them yielded 1,100 lbs. of *kapas* per acre at Coimbatore and 850 lbs. at Srivilliputhur, *i.e.*, as much as irrigated Cambodia. In spinning performance, they were adjudged suitable for 33's and 34's standard warp counts respectively.

The Committee ceased to finance this scheme with effect from the 31st May 1938, and the Provincial Government have taken over the work. The

total expenditure on the scheme for the 15 years during which it was financed by the Committee amounted to Rs. 1,42,850. The results of the investigations carried out are summarised below :—

1. Eleven strains in *Uppam* cotton have been isolated, but they are all much poorer than *Karunganni* in yield and quality.

2. As the extent of variability in *Uppam* has been found to be very limited, there is little scope for improvement by selection.

3. '*Uppam*' variety is not as drought resistant as it is claimed to be. Its merit lies in affording scope for interspecific hybridisation as a result of which hybrid plants with great vigour, earliness and *prolificity* are produced.

4. *Herbaceum* types grown in other parts of India do not suit the conditions obtaining in the Southern and Central districts of Madras Presidency.

5. As a result of hybridisation started in 1930, twenty-nine strains possessing fineness and lint length equal to *Karunganni* have been isolated. Amongst these, seven strains have excelled the standard *Karunganni* strain *K.I* in yield during the last two seasons.

6. These strains have been found to behave satisfactorily in years of low rainfall.

7. As a result of off-seasonal study, two strains with higher yield and greater wilt resistance have been isolated in Bengal gram. These are being multiplied and distributed in parts of Coimbatore district.

8. In addition, fundamental knowledge has been acquired on the origin of lint fuzz and on the mode of inheritance of pollen and lint colour in cotton and of seed colour, seed size, flower colour, habit, and wilt resistance in Bengal gram. These items form the subject of fifteen published papers.

13. *Pempheres and Physiological Scheme.*—This scheme was sanctioned in 1925 for a period of five years, but, owing to difficulty in securing a competent plant physiologist, it had to be kept in abeyance till 1931 when it was decided to send for training to England two officers selected from the Madras Agricultural Department, with a view to their eventually occupying the posts of Physiological Botanist and Biochemist under the scheme. In the meanwhile, preliminary investigations were started under the direction of the Cotton Specialist, Coimbatore.

The scheme consists of two investigations, one for the control of cotton stem weevil (*Pempheres affinis*) and the second for the evolution of a strain in *Karunganni* cotton resistant to the harmful effects of February rains. The first problem is being studied at Coimbatore, and the second at Koilpatti.

The control of *Pempheres* is being pursued in three directions, botanical, bio-chemical and entomological. On the botanical side, the aim is to evolve a strain which will not allow the insect time to complete its life cycle inside the stem; on the bio-chemical side, the causes that make strains susceptible to insect and the factors that help the plants to resist its attack more efficiently are being investigated; on the entomological side, efforts are being concentrated to survey the distribution of the insect and to explore the possibility of checking its spread by biological methods.

During the year under review, *Co.* 2 was crossed with several South American types which possess the peculiar feature of producing gum which does not allow the larvæ to escape. Some of the crosses, which have reached the second and even fourth generation, appear very promising in that they do not show any mortality in plants and no adult emergence. These crosses are now being studied for purity in order to ascertain whether their progenies behave in the same manner.

On the bio-chemical side an endeavour is being made to find out if there is a chemical criteria by which resistant cotton could be distinguished from susceptible types. Nothing practical has emerged so far from this investigation.

On the entomological side efforts are being made to determine whether the *pempheres* could be controlled by biological means. Many parasites have been found, but, as in nature their incidence on *pempheres* is as low as 5%, the beneficial effects to be expected are negligible. The discovery of three more alternative host plants has made the problem still more difficult of solution. Further investigations are in progress.

As a result of the physiological work done, four strains with a lower shedding index than *K.* 1 have been isolated, but their behaviour cannot be taken as conclusive. The work of the year showed that sowing cotton thick is more remunerative to the cultivators of '*Tinnevellies*' tract and that mixing cotton with coriander gives better results. These experiments will be repeated before any definite conclusions can be drawn.

14. *Scheme for improvement of Mungari cotton in Madras Presidency.*— This scheme which was sanctioned by the Committee in March 1937 and commenced work from 3rd May 1937 has for its object the evolution of strains suited to the red soils, combining the quality of the *Westerns* with the yield of *Mungari*, to replace the inferior *Mungari*, the existence of which affords opportunities for undesirable mixing in the tract with the result that better cottons fail to get their legitimate prices.

Owing to unfavourable weather conditions, the experiments during the year under review were robbed of much of their utility. The rainfall was exceptionally low and the plants of the experimental plots were stunted in growth and the yields were only 50% of the normal. Thirty-seven strains were compared with the local *Mungari* in respect of yield. Eight were found to be

statistically equal to the local mixtures; the behaviour of the strains was, however, erratic on account of unfavourable season. In the "Progeny Row" trials, 92 cultures were tested against local and *M.* 274 as standards, and 39 of these were found to be statistically better than the standards. Fresh selections were made in Local *Mungari* and in some of the promising imported strains on the basis of number of bolls. Of these, about 24 strains which had lint length above 23mm. and ginning percentage above 31, were selected for testing in "Progeny Rows". To determine the composition of *Mungari*, samples from *Mungari* growing centres were obtained and sown in fairly big plots in the experimental area at Adoni. The results showed that *Neglectum forma Bengalensis* types form the major component in all the centres. At Hospet the proportion of yellow-flowered forms was found to be greater, while at other centres white flowered *Bengalensis* forms predominated.

15. *Nadam Cotton Breeding Scheme.*—This scheme commenced in February 1933 with the object of securing one or two suitable annual types of cottons which could replace *Nadam* (*G. obtusifolium*) a perennial variety in the red soil areas of Salem and Coimbatore districts where due to poor soil and precarious rainfall neither *Karunganni* (*G. indicum*) nor *Uppam* (*G. herbaceum*) can be satisfactorily grown. *Nadam*, being a perennial variety, serves as a breeding ground for pests like stem weevil and pink bollworm during the close period of *Cambodia* prescribed under the Madras Pest Act.

During the year under review, 266 cultures consisting of 47 lines from Asiatic crosses and 219 from the American group were compared for yield with local *Nadam* in short rows arranged in family block system. All the higher yielders were examined for lint length and ginning percentage. The best 20 cultures from amongst the progeny row cultures were split up into three groups on the basis of number of seeds and sown for comparison on field plot scale. All excepting one gave yields lower than 100 lbs. per acre. Eight of the Uganda crosses evolved at the Cotton Breeding Station, Coimbatore, were sown on two dates—29th September and 31st October—in replicated plots with the object of studying their response under *Nadam* conditions. The later sown seed, however, failed, while in the early sown experiment strain 4383 recorded the highest weight and was found to be significantly better than *Co.* 2.

Fresh selections from the progenies of *Co.* 2 x *R. U.* 4 (Asiatic American hybrid produced by Dr. Harland) and *Co.* 2 x Russian *hirsutums* were found to be very early at the Cotton Breeding Station, Coimbatore. Some of these were also tried at Perundurai for earliness and yield. Further work on promising cultures in *Co.* 2 x *U.* 4 is in progress.

Bombay.

16. *Broach Cotton Breeding Scheme.*—This scheme is concerned with the breeding of suitable types of cotton possessing wilt resistant, high yielding, high ginning and good spinning qualities, for replacing the local mixture in the Nerbudda Mahi zone consisting of a large percentage of *Goghari*, a rough

high ginning, short staple variety which is susceptible to wilt. Strain *B. D.* 8, which is highly resistant to wilt, has been crossed with several high ginning types and 14 crosses obtained. During the year under report, the seed of one of the best plants from each of the 14 segregates was sown in random replications on wilt-infected and in wilt-free soils to test their relative resistance and it was found that segregates 76–1, 76–8 and 76–12 of the straight cross *B. D.* 8 x *G. A.* 26–*F*7 and 1–2, 1–6, 1–10, 5–18, 6–20 and 6–25 of the back cross—(*B. D.* 8 x *G. A.* 26–*F*1) x *B. D.* 8–*F*5 were worth retaining for further trial.

Several single plant progenies of the second best lot from segregates 76 and others of the cross *B. D.* 8 x *G. A.* 26–*F*7 were grown in single plant rows in duplicate plots and several best plants with ginning percentage 37 and above and staple length above 21 m.m. were selected for further trial.

Three crosses, *viz.*, *B. D.* 8 x 1027 *A. L. F.*–*F*3, (*B. D.* 8 x 1027 *A. L. F.*—*F*1) x *B. D.* 8–*F*2 and (*B. D.*8 x *N. S.* 12–*F*1) x 1027 *A. L. F.*—*F*2 were handed over to the Wilt Breeding Scheme for Surat area in the hope that they would prove useful for that tract.

New selection 49, which has a ginning percentage of 34 and is highly resistant to wilt, and spins 31's, was maintained as a new type. Another new selection No. 12 which has a ginning percentage of 39 and spins 26½'s was tested against *B. D.* 8 for yield and has been found to be statistically superior. It will be included in yield trials along with other crosses.

17. *Jalgaon Cotton Breeding Scheme.*—This scheme, like the Broach Cotton Breeding Scheme, commenced in April 1932, the object being to secure by unit selection or hybridisation a commercially useful and highly wilt-resistant strain with good ginning and spinning qualities to replace *N.R.* or *Banilla* in Khandesh. As a result of five years' work, a variety named *Jarila* (*N.V.* 56-3) was evolved and given rigid yield trials in the past two years. During the year under review, it was compared with *Banilla* and *N.R.* in the 'Precision trials' conducted at Jalgaon, Bhadgaon and Dhulia Farms. On the Jalgaon Farm, other promising strains, *viz.*, *N.V.* 56-4 and *N.V.* 201-3 were also included. In these trials *Jarila* gave significantly higher yields than *Banilla* or *N.R.*

In the extensive village trials conducted at 39 centres in Khandesh, *Jarila* gave yields superior to local in 18 trials, equal to the local in 13 trials and inferior to the local in 8 trials. The ginning percentage of *Jarila* ranged from 32.5 to 36. The lint samples were subjected to laboratory and mill tests. Both farm and commercial samples were sent to the Technological Laboratory and the variety was found suitable for 22's to 36's highest standard warp counts. The mill tests carried out in Century Mills, Bombay, on a commercial sample gave 19.9 counts for an average test of 80 lbs. and the cotton was declared to be very good except for its leafiness. The prices obtained at auction sales were quite encouraging, the premium ranging from Rs. 26 to Rs. 43 over *Broach.*

A preliminary wilt survey work undertaken during the year indicated the prevalence of wilt in parts of West Khandesh (hitherto regarded as a wilt-free zone) although it was of a sporadic nature in lighter descriptions of soils. Hybridisation of *Jarila* with *N.R.* 5 and *Million Dollar* was undertaken during the year with the object of combining ginning percentage and high wilt-resistance in *Jarila*. The work of isolation of more desirable and promising types than *Jarila*, is being continued in the cottons brought from Chandur. 27 plants have so far been selected and their purity and wilt-resistance remain to be tested. The comparative flower study in the varieties, *Jarila*, *Banilla* and *N.R.* during the year indicated that the flower producing capacity of *Jarila* was greater than that of *Banilla* and *N.R.* by about 1½ times and that its boll-formation capacity was decidedly superior to either of the other two varieties. A nucleus of 100 lbs. selfed seed of *Jarila* was maintained on the Jalgaon farm during the year.

18. *Scheme for improvement of Wagad cottons at Viramgam.*—While examining the possibility of growing medium and long staple cotton in the present short staple areas of India, the Committee in August 1935 decided that, in view of the absence of any serious attempt to improve the cotton of the large *Dholleras* tract, a comparative study of Indian and Iranian *herbaceum* cottons should be undertaken, with the object of finding out one or more suitable types for the tract. A special officer from the Institute of Plant Industry, Indore, was deputed to Iran to collect *herbaceum* types of cotton grown there and in August 1936 a five-year scheme was sanctioned for the improvement of *Wagad* and *Mathio* cottons, the work on *Wagad* cottons being centred at Viramgam and that on *Mathio* at Amreli. Simultaneously, a small immune area was maintained at Jagudan under irrigation to safeguard the work at Viramgam.

The scheme commenced on 1st May 1937. Work on the scheme is directed towards improving the *Wagad* cotton for (*a*) quality and yield and (*b*) earliness in order to escape frost and to replace, if possible, the inferior *Mathio* cotton, (*G. arboreum* var. *neglectum*) of Kathiawar tract by early *herbaceums*. As a result of earlier work, a strain called *Wagad* 8 has been evolved which has been found superior to the local in yield and ginning percentages giving 15 to 20 per cent. more lint. Of the fresh selections made from 1933-34 onwards, 13 types have shown promise. A few of the additional selections for earliness, possessing sympodial habit and good bearing with desirable economic characters, will be grown in progeny row cultures next year.

Forty individual plants with desirable characters have been selected from *F*3 and *F*4 hybrid populations of the crosses of *Wagad* types with *Surti-Broach* quality cottons, like 1027 *A.L.F.* and *B.D.* 8.

The Iranian *herbaceums* have been found unsuitable for Viramgam conditions as the seedlings rot if there are continuous rains in July and are also affected by *anthracnose*. A few types of *herbaceum* cottons from Russia were also grown and proved less susceptible than the Iranian ones. Preliminary crosses of *Wagad* 8 with Iranian and Russian types were made for quality and earliness, respectively.

19. *Scheme for breeding of wilt-resistant cottons in Surat area.*—This scheme was sanctioned by the Committee in August 1936 and commenced work in April 1937. The object of the scheme is to obtain a strain of cotton which would be suitable to the natural conditions obtaining in the Surat tract and which would, at the same time, be completely resistant to wilt. This is sought to be achieved either by selection in 1027 *A.L.F.* or by crossing the latter with *B.D.* 8 or other wilt-resistant strains. The scheme is in its first stage of field selection. A plot of land at Shera near Ankleshwar has been artificially infected with wilt and in the course of a year or two, it will be ready for the testing of cotton strains for wilt resistance. At present this work is being done at the Broach and Surat Farms. Several selections have been made, but the work is yet in its infancy.

20. *Scheme for Survey of Goghari Cotton in Gujerat.*—This scheme was sanctioned in August 1934, for a period of five years, for carrying out a field to field survey of *Goghari*, with a view to tracing it to ginneries and inducing the latter to discourage its cultivation by paying low prices. It came into operation in January 1935. During the year it was reported that, as a result of the passing of the Cotton Control Act of 1935, *Goghari* has been completely eliminated. The scheme is due to terminate in December 1939.

21. *Plant Puller Propaganda Scheme in Surat and Broach Districts.*—This scheme, which has for its object the eradication of the spotted bollworm by the uprooting of cotton stalks by the use of plant pullers, was sanctioned in August 1933. The year under review is the fourth year of propaganda in the district of Surat and part of Broach where a thorough clean-up campaign was not previously applied. Intensive propaganda was conducted specially in the Jambusar *taluka* of Broach district where the work of uprooting cotton stalks had not yet sufficiently progressed, while in the area south of the Narmada the work was concentrated in the three *talukas* of Ankleshwar, Olpad and Chorasi, where it had made good progress. 1,244 plant pullers were supplied in the area north of the river Narmada and 2,600 in the tract lying south of the river. Owing to the lateness of the crop in Jambusar, not more than 60 per cent. of the area was cleaned by about the middle of May, and the percentage of stalks uprooted with the plant puller was about 30 per cent., as against 20 per cent. in the past year ; while in the three talukas of Ankleshwar, Olpad and Chorasi the percentage of area uprooted was about 47 per cent., 77 per cent. and 62 per cent., respectively. In the rest of the *talukas* of Surat district, the percentage of area uprooted varied from 13 to 35 per cent. As the crop did not make vigorous growth, owing to continuous heavy rains till September, it was difficult to persuade the cultivators to uproot the stalks. The difficulty was further aggravated by the slump in cotton prices. These factors tended to reduce the demand for plant pullers.

22. *Scheme for inclusion of Northerns and Westerns cottons in programme of work of Dry Farming Scheme at Bijapur.*—This scheme was sanctioned by the Committee at its meeting held in August 1936 for a period of one year, and is the outcome of the recommendations at the Agricultural Research Sub-Committee, which, while considering the subject of the possibility of growing long

and medium staple cottons in the short staple cotton areas of India, expressed the opinion that in short staple cotton areas, like the Bijapur district in the Bombay Presidency and the Raichur and Gulbarga districts of the Hyderabad State, where the rainfall is limited and precarious, a solution of the problem confronting the successful growing of medium and long staple cottons might be found in devising suitable dry farming methods. The scheme came into operation in June 1937. The year under review was one of scanty rainfall and the distribution also was not normal. The usual sowing time of cotton in the tract is the latter half of August, but on account of failure of early rains, the sowing had to be postponed till the first week of October ; the results from such late sown crop cannot, therefore, be taken as normal and no conclusion of value can be drawn from the results of the past season.

Sind.

23. *Scheme for Cotton Jassid Investigation.*—In Sind, Jassid attack is most prevalent at present in the South-East Thar Parkar district where it has been decided to establish a compact block of long staple cotton. One of the harmful effects of this pest is the improper development of seed, so that, in certain seasons good seed is not available for sowing purposes, thereby resulting in a set-back to the extension of improved varieties. In August 1937, the Committee, realising the need for a detailed study of jassid attack and its prevention in Sind, sanctioned this scheme for a period of three years and six months. The scheme came into operation in May 1938.

Punjab.

24. *The Punjab Botanical Scheme* was started in 1925 with the object of investigating the causes of the periodic failures of American cotton in the Canal Colonies and obtaining suitable types of American and *Desi* to replace the *4F* and *Desi* cottons, respectively. In view, however, of the immediate economic value of the improved types of cotton, work was concentrated on breeding and a separate physiological scheme sanctioned for the investigation of the problem of periodic failures of American cotton.

During the year under review, *289F/43*, a new strain of Punjab-American cotton, which was approved for general distribution in 1934, occupied an area of over a lakh of acres. Its chief features are early maturity, drought resistance and a better yield than *4F*. In spinning performance it goes up to 40's. Of the *desi* cottons, 39 *Mollisoni*, which is much favoured by the *zamindars*, covered several lakhs of acres, while *Jubilee* cotton, a new *desi* strain, was given extensive trial. Another new strain, known as 119 *Sanguineum*, which is early maturing and possesses very high ginning outturn (38%), will be tested extensively in the Multan tract for which it has been specially developed.

Hybridisation work with a view to combine the desirable characters of several strains into one is also in progress. *Tanguis* cotton has been used to introduce jassid resistance in the Punjab-American strains. Watering experiments have indicated that the current practice of the Punjab farmers

of delaying the first watering is not good for the crop, and that first watering should be given during the fourth week after sowing. Several *zamindars* are now adopting this practice.

25. *Physiological Scheme.*—Partial failures of the American cotton crop in the Punjab occurred in the years 1919 to 1921, 1926 to 1928, 1931 and 1932. The external symptoms of the cotton plants during these failures were early reddening and shedding of the leaves, premature opening of the bolls with immature seeds and low quality lint and, in extreme cases, the dwarfing of the plant. To account for these failures various views were advanced, such as the heat stroke theory of Milne (1924), attack of white fly (Roberts, 1929) and unfavourable combination of climatic and biotic factors (Trought 1931). As, however, these theories could not be supported by sufficient scientific data, it was thought that these failures were due to malnutrition of the plant. A Physiological Scheme was accordingly started in March 1935 to study the physiology of the cotton plant with a view to determining, if possible, the nature of nutritional disorder and the causes underlying it.

The annual report for 1937 recorded briefly the work done on the scheme during the first three years. During the current season (1938), the physical and chemical investigations of the soils from the bad and good patches have clearly shown that there are two types of soils where '*Tirak*' appears. These are (*a*) soils with high concentrations of alkali salts in the subsoil and (*b*) soils with deficiency of nutrients.

In the first type of '*Tirak*' patches, the subsoil is heavily impregnated with bicarbonates, sulphates and chlorides of sodium which may vary from 2,000 to 5,000 p.p.m. from the 2nd or 3rd to the 6th foot of the subsoil. These soils are heavy with very high proportion of clay plus silt fraction which also increases from above downwards. The permeability of these soils is consequently lower than normal. For the first two and a half months after sowing the crop on such patches is normal. The drooping of leaves a week after irrigation is the first symptom of the disease to appear early in August or later. Other symptoms follow soon after. There is no yellowing of the leaves which begin to shed in September. The root growth appears to be suppressed. '*Tirak*' appears later, its intensity depending on the depth and the concentrations of alkali salts in the subsoil. The plants begin to suffer from lack of water as a result of which the whole metabolism of the plant is upset. High concentrations of alkali salts also prove injurious to the cells of the roots and leaves.

In the second type of '*Tirak*' soils, the proportion of total sand is very high in the upper layers of the soil. The internal symptoms of the disease first appear in the roots and then in the leaves which turn yellow and red and are shed. The root growth is not suppressed in these plants. '*Tirak*' appears later. In this case, the plants suffer from lack of nutrients at a time when the demand for these is greatest. This occurs at the flowering stage and the leaves then show signs of starvation, *viz.*, yellowing, reddening and shedding.

During the year under review, ameliorative measures to counteract the adverse soil conditions described above were tried. These measures cannot be applied unless the nature of the soil type, as defined above, is known. The nature of the soil type can now be inferred also from the external symptoms of the disease exhibited by the leaves of plants. Of all the ameliorative measures attempted so far on soils with alkali salts in the subsoil, late sowing (middle of June) had the effect of saving the crop from the onslaught of the disease. Late sowing was done to suppress vegetative growth, so that water deficit is avoided at a time when the loss of water from the plants is the greatest. In the early sown crop, the symptoms of disease appeared by the first week of August. In the second type of soil, applications of nutrients containing nitrogen, potash and phosphorus produced beneficial effect on the growth of plants. No yellowing, reddening or shedding of the leaves occurred, while all these symptoms were seen in the untreated plots. The effects of these applications on the opening of the bolls, however, remain to be seen. It may be stated that late sowing, in soils lacking in nutrient deficiency, will not remedy the disease any more than the application of nutrients on soils with alkali salts in the subsoil, will save the crop from '*Tirak*'.

The experiments on ameliorative measures will be repeated during the coming season.

26. *Pink and Spotted Boll-worm Scheme.*—The Committee sanctioned in 1926 a Pink Bollworm Scheme with the object of ascertaining the causes for the difference in the incidence of the Pink Bollworm between the Canal Colonies, where it is practically absent, and the South-East Punjab, where its attack is severe. The Pink Bollworm Scheme concluded in 1934, when it was replaced by the Combined Pink and Spotted Bollworm Scheme for the continuation of work on the Pink Bollworm and the investigation of certain economic aspects of the Spotted Bollworm. This scheme terminated on the 31st March 1938. The work done under it is summarised below :—

The biology of the three species of the *Earias* (the Spotted Bollworms), found in the Punjab, has been studied. The moths are active at night, when they emerge, copulate and lay eggs. The proportion of males is slightly higher than that of females. The number of eggs laid vary with time and place and there seems no direct correlation between the number of eggs laid and the severity of attack. The duration of life-cycle varies considerably; in summer it may take only 18 days, while in winter it may take as many as 136 days. Two species of *Earias* (*fabia* and *insulana*) are active throughout the year, but the third species, *cupreoviridis*, assumes resting stage, which may last for about 5 months.

Two species of *Earias*, namely *fabia* and *insulana*, are found on cotton throughout the Punjab. The proportion of these two, however, varies considerably during different months. *Fabia* may be common during two or three months in certain years in south-eastern and parts of Central and sub-mountainous regions and attain the status of a pest in these regions. *Insulana* is very common during the whole of the cotton season and is the major pest of this crop in the province.

The incidence of Spotted Bollworms (*Fabia* and *insulana*) was studied at 5 stations, representing the important cotton growing tracts of the province. Cotton plants are attacked from the time they are 4 to 5 weeks old. First the top and the side shoots are attacked and destroyed. When the flower-buds and bolls appear they are attacked and mostly shed. The intensity of attack varies from year to year and from place to place. Generally, the attack is low in sub-mountainous and south-eastern regions of the province, mild in the Central region and high in the Canal Colonies and the western region.

Protecting the cotton crop from the attack of Spotted Bollworms results in triple advantage—high yield, early crop and clean *kapas*. The increase in yield at Lyallpur was estimated at about 12 to 56 per cent. (mean of both *desi* and American cottons) during different years.

Earias species are found on several *Malvaceous* plants. There are, however, only two hosts—hollyhock and *bhindi* on which all the three species are found, while on all other hosts either one or two species are found. *Cupreoviridis* is found on 4 host plants, *fabia* on only three and *insulana* on almost all of them.

Moths of different species of *Earias* copulate among themselves. When females of one species copulate with males of another species, the eggs laid may not hatch, as is the case in the cross of male *fabia* or *insulana* with female *cupreoviridis*. If the eggs are laid they may not hatch, such as in the cross of male *fabia* with female *insulana*. If the eggs laid hatch, such as in the cross of male *insulana* with female *fabia*, the resulting progeny is sterile.

The biology of the common parasites of Spotted Bollworm has been studied in detail. *Elasmus* species and *Microbracon lefroyi* are external larval parasites and their hosts include all the three species of *Earias* and *Platyedra gossypiella*. The adult parasites copulate readily in light. The number of eggs laid by them vary with season and place. Usually more than one egg is laid on a host larva. On a single Spotted Bollworm larva, as many as 20 eggs may be laid, but on Pink Bollworm larva, it is only seldom that more than three eggs are laid. The duration of life-cycle varies considerably with the season. In summer it may be completed in 7 to 8 days, but in winter it may take more than a month and a half.

Actia aegyptia and *Rhogas testaceous* are internal larval parasites. Their hosts include probably all the three species of *Earias*. Eggs are laid inside the body of the host caterpillars which go on feeding for a few days afterwards. They (host larvæ) die when the parasite grubs are full-fed. Only one egg is laid in the body of a caterpillar by females of *Rhogas*. The development of all the stages is completed inside the body and the adult parasites emerge by cutting a circular hole at the posterior end of host larvæ. In case of *Actia*, several eggs (1-5) are laid in the body of a host caterpillar. The incubation period and the larval stage is completed inside the body, but the full-fed grubs come out of the host larvæ to pupate. The duration of life-cycle of *Rhogas* may vary from 9 days in summer to about two and a half months in winter.

Chalcis techardiae and *Melcha nursei* are pupal parasites of, probably, all the three species of *Earias*. *Chalcis* females lay only one egg inside a host pupa, but *Melcha* females quite frequently lay more than one egg. When more than one egg is laid, the grubs die for want of sufficient food. The duration of life-cycle may vary from about 10 days in summer to about 3 months or more in winter.

The occurrence of the parasites of the Spotted Bollworms was studied at several stations. Besides the six parasites mentioned above, very rarely three or four other parasites emerged. Of the six common parasites, the incidence of *Elasmus* and *Actia* is very low and does not exceed 5 per cent. *Microbracon* is very common in the south-eastern regions of the province, usually during the early part of the cotton season. Elsewhere it is common only towards the end of the cotton season and is quite rare in the beginning of the season.

Rhogas, *Chalcis* and *Melcha* are fairly common throughout the province, and more so towards the end of the cotton season.

Besides cotton, *Earias* larvæ subsist on 11 different *Malvaceous* plants. Only four of these are cultivated hosts, the rest being wild weeds, annual or perennial. During the off-season of cotton, *Earias* larvæ subsist on 6 host plants and also on the cotton sprouts.

The most important source of the carry-over of these pests from one cotton crop to another are the cotton sprouts, and to a much less extent four other weeds. All other hosts are very rare. Cotton sprouts are found in innumerable numbers throughout the cotton growing tracts of the province, while the four weeds are common in South-eastern, Central and sub-mountainous regions of the province, and rare in the Canal Colonies and the western region.

These observations show that by stopping cotton stumps from sprouting and by destroying wild weeds it will be possible to prevent the carry-over of these pests from one crop to another.

An implement has been devised which cuts the cotton sticks about 2 inches below the surface of the soil and stops them from sprouting. This measure is at present under trial in an area of about 500 square miles.

27. *Punjab Root Rot Scheme.*—This scheme commenced in 1932 for the investigation of root rot in the Punjab, where, particularly in the canal-irrigated areas, the annual damage done to cotton by this disease is estimated at several lakhs of rupees. Both *desi* and American varieties are equally affected by the disease which makes its appearance towards the end of June when the crop is 6 to 8 weeks old, and continues up to the middle of September. Rain-fed cottons, however, are not affected and the activity of the disease increases in proportion to the amount of irrigation or soil moisture. The organisms responsible for the disease are *Rhizoctonia bataticola* and *Rizoctonia solani*. During the year under review the incidence of the disease in the whole province, particularly in the Canal Colonies, was much higher than in the past seasons. Low

temperature and high humidity appear to be unfavourable for an active attack of the causal fungi. The data available show that if the time of sowing cotton is varied, there is considerable difference in the mortality of plants. The incidence of the disease is considerably reduced in the late sown crop after the middle of June. In the experiment in which different varieties were sown late, 83 *A.F.* appeared to be comparatively less susceptible. No resistant type has so far been met with amongst the Indian varieties tested during the previous years. There are indications, however, that success may be achieved by selection of resistant types from foreign material. In the experiment on soil treatment, calcium chloride has been observed to reduce the incidence of the disease to a certain extent.

28. *Scheme for Cotton Jassid Investigation.*—This scheme was sanctioned by the Committee in March 1937 and came into operation on the 1st April 1937, the object being the study of the jassid insect in the Punjab as regards its habits, alternate host plants and the characters of the plant which determine resistance to the pest.

Preliminary observations during 1937 showed marked differences in the incidence of attack between *desi* and American cotton and also between different varieties of American cottons. 289*F*/*K*. 25 was found to be very susceptible, while 289*F*/43, *L.S.S.*, 4*F* and 100*F* were fairly resistant. The period of severe infestation was from the middle of August to the end of September. The incidence of attack was determined by the following three methods :—

(1) Collection of adults by sweeping with a hand net and counting them.

(2) Fumigation of individual plants with calcium cyanide dust and counting all the nymphs and adults.

(3) Counting of adults and nymphs in living condition on the plants in the field, by carefully turning over the leaves. The insects were not found on all the leaves of the plant, but were mostly confined to the upper portion.

The conclusions drawn from the experiments carried out during the year under review are given below :—

(1) The jassid (*E. devastans*) attacked chiefly the American cottons in the Punjab. Of these, some were attacked much more in nature, than others but this preference was not so marked in confinement under artificial conditions, at least in the case of American cottons so far tested. *Desi* cottons seemed to resist jassid attack.

(2) Resistance of the *Desi* cottons resulted from the inability of the jassid females to oviposit freely on them.

(3) Nymphs were able to develop perfectly well on all varieties whether *Desi* or American and there did not seem to be any resistance to feeding of the nymphs.

(4) *Desi* cottons are more hairy than American cottons but the fact that nymphs were able to develop equally well on all varieties showed that the hairiness of the leaves was no factor in the development of the nymphs. Whether it is a factor in restricting oviposition, in leaf veins, is not yet known.

(5) *Tanguis* cotton appeared to be the only long staple variety which was vary resistant to jassids.

29. *Clean-up Scheme.*—This scheme was sanctioned in March 1937 for a period of two years and is the outcome of the Punjab Entomological (Pink and Spotted Boll-worm) Scheme, which successfully terminated in March 1938. The object of the scheme is to show, by practical demonstration over an area of 500 square miles in the Canal Colonies, that better yields of *kapas* can be obtained by eliminating the Spotted Boll-worm. This is sought to be achieved by clearing the whole cotton area, of all cotton stalks and stubbles immediately after picking is over and by eradicating at the same time the alternative host plants. The scheme was put into operation in April 1937. During the year under review a compact area of 500 square miles comprising about 180 villages of Lyallpur and Jhang districts was selected in a circle with 2½ miles radius. As the Surat plant-puller did not work well in the hard soils of the colony areas, an implement called "*Kudali*", which cuts the cotton plants 2 inches below ground level and which is a modification of the Lantana *Kudali* from Mysore, was substituted.

Extensive educational propaganda was undertaken during the first few months, by means of meetings and personal discussions with large numbers of *zamindars* at many places. During these discussions the damage caused by the Spotted Boll-worm and the control measures were explained.

The actual cutting of the cotton stalks began in January 1938, and was practically over by the middle of March. As a result of the intensive mass propaganda done by the Department of Agriculture and with the full co-operation of the Revenue and Canal Departments about 97% of the total area was cleaned up. From the remaining 3% which had been cut with *Toka*, the stumps were removed as carefully as possible. In addition, *abutilon* (*Kanghi booti*), a wild host plant of the pest, was eradicated and the cultivation of ladies' finger (*bhindi*), Hollyhock (*gulkhaira*) and early cotton was stopped in the area under operation.

A second campaign to destroy the small number of sprouts, which sprang up in spite of the Agricultural Department's efforts, was conducted during the first half of April, 1938. Every effort was thus made to starve the pest by eliminating all its food plants during the off-season of cotton.

The effect of these operations will be studied carefully during the next cotton season.

Central Provinces.

30. *Botanical Scheme.*—This is one of the earliest schemes of the Committee and one that has yielded results of practical value. It commenced in 1923, was renewed in 1929, again in 1933, and the present sanctioned period terminates on 31st March 1939.

The main work under this scheme has been concerned with the breeding of new strains of cotton suitable to the conditions obtaining in the various cotton growing areas of the province and especially capable of resisting the handicaps imposed by wilt and other diseases. In addition, only such other crops have been worked at as experience showed to be suitable rotation crops for making the growing of cotton a permanent success. Many other features bearing on the improvement in efficiency of cultivation, harvesting and utilisation of by-products have also been investigated.

The first cotton to be evolved under the scheme was *Verum* 262. Being a pure line selection for wilt resistance, it fulfilled the immediate requirements of the time, and was a considerable improvement over *roseum*. With a ginning percentage of 32 and capacity to spin 20's to 22's highest standard warp counts, it gave a lint yield which, on wilted land, was unquestionably higher than that of *roseum*. Experience, however, showed this cotton to be susceptible to variations in climatic conditions which rendered estimation of its cropping power a difficult matter owing to wide fluctuation in yield from year to year. A cotton that would be suitable for growing in the districts of heavier rainfall to the east of Berar and in the Central Provinces where the monsoon lasts till rather late in the season was thus the immediate need of the moment and this was provided by the successful development of late *Verum* from the original resistant material of *Gossypium neglectum Verum*. While progress of these two strains was carefully watched in the field, investigations were continued for the finding out of a strain of indigenous cotton which would serve as a good all-round type suitable for growing anywhere in the Province. By 1933, the fixing of such a type became possible and led to the development and multiplication of *V.* 434, the chief merit of which lies in its adaptability to varying conditions of soil and climate. It is a strain which possesses, in addition to wilt-resistant qualities, drought resistance, prolific flowering capacity, quickness in forming buds and setting fruit, comparative freedom from shedding and excellent lint characters and good ginning percentage. With a staple length of nearly 1 inch, this cotton has been adjudged suitable for spinning 32's to 37's highest standard warp counts—a great advance over the 8's of *roseum* and 20's of *Verum* 262. The premium which this cotton obtains more than compensates for its slightly lower ginning percentage as compared with *Jari*. *V.* 434 is thus the best all-round type available at present—hardy, prolific and superior in quality—and the existing varieties are being gradually replaced by it. It is reported that the area under it is spreading very rapidly.

The chief features of the year under review was the success which attended the cultivation and expansion of *V.* 434 which, despite unfavourable season, again showed its superiority over all other types of cotton grown.

There is reported to be a great demand for the seed of this cotton, not only within the province, but also from outside. Another important item of the work was the development and comparative trial on a field scale of the four new strains of *Gossypium indicum*, *viz.*, *B*.61, *B*.64, *B*.73 and *B*. 90 at the various Government Farms. These, besides being resistant to wilt, possess very fine long lint which is capable of giving the best spinning performance attainable in an Indian cotton. The work of single plant selections from the original pure stock of *Verum* 262, *late Verum* 434, *Bani* 306, *E.B.* 31, *Buri* 84 and *Buri* 107 was continued with the object of eliminating, if possible, any defects observed and to isolate new forms possessing greater ginning percentage and higher yields. *Late Verum* was grown on an extensive scale during the year in areas of heavier rainfall and is reported to have continued to do well. In view of the all-round suitability of *V*. 434, however, and the desirability of having as few types as possible in adjacent areas, the Agricultural Department recommends that, except in places where *late Verum* shows a distinct superiority over *V*. 434, the latter type alone should be grown. *No*. 438 cotton, another type, was again found to be specially suitable for lighter descriptions of soil. Work on *Bani* x *Cernuum* cross was continued and the results obtained during the year are reported to be encouraging. The most promising four pure strains, *viz.*, *H*. 413, *H*. 414, *H*. 415 and *H*. 420 were grown last season at the Nagpur Farm, for preliminary yield trials. The crosses showed good spinning performance being adjudged suitable for 29's to 32's highest standard warp counts. The next step will be their trial on a field scale. 33,752 lbs. of pure seed of approved cottons were produced and distributed under departmental supervision.

31. *Entomological Scheme.*—This scheme was sanctioned in January 1934 and commenced work in July 1934. The object of the scheme was to ascertain the incidence and distribution of the boll-worms in the cotton tracts of the Central Provinces and Berar, the extent of damage caused, the means of carryover from one season to another, and the extent to which the results obtained under the Surat Boll-worm Scheme could be usefully adopted in the Central Provinces. The work done showed that there are three types of boll-worms, *viz.*, the Spotted Bollworm ((*Earias fabia, Stoll*), the Pink Bollworm (*Platyedra gossypiella, Saund*) and the American Bollworm (*Heliothis obsoleta*, Fb.), which attack the cotton crop in these provinces. Cotton is sown generally in the last week of June or in the first week of July and becomes ready for picking by the latter half of October or early November. Pickings generally continue till the end of December but in exceptional seasons they may be prolonged to the end of January. The Spotted Bollworm (*Earias fabia*) remains active in cotton fields throughout the season and causes a considerable amount of loss in the final yield of *kapas*. The American Bollworm (*Heliothis obsoleta*) joins the former during the bud and boll development stage for six or seven weeks and, on account of its voracious feeding habit, causes, in this short period, no less damage than the Spotted Bollworm. With its disappearance towards the middle of October, the Pink Bollworm (*Platyedra gossypiella*) makes its appearance, but due to its slow rate of multiplication and feeding habits, it is not considered a serious pest of cotton in these provinces.

In order to estimate the increase in yield in the absence of bollworms, 48 plants were protected by the "Night Caging" method at Nagpur and a similar number was kept as control. The plants completely protected from damage by bollworms produced 27 per cent. more pickable mature bolls than those which were exposed to bollworm attack. The final yield of *kapas* from protected plants was 51 per cent. higher. At Akola, where these experiments were repeated, the increase in the final yield was 49·6 per cent.

The scheme terminated in September 1937.

"*Carry-over*".—As the new crop is sown between the middle of June and the end of the first week of July according to the monsoon conditions, there is a clear span of 5 or 6 months between the close of one season and the commencement of the next. The bollworms bridge over this critical period and reinfect the crop of the new season. The cotton plants are allowed to stand in the fields long after the last picking is over. They put forth fresh growth and numerous buds, flowers and bolls being found on them till the end of April. The Spotted and Pink Bollworms breed in them. In several places in Berar, the plants are intentionally allowed to stand in the fields till the end of April in order to pick the *kapas* from the second flush. The fields are cleaned by the end of May or the beginning of June. Thus the food for the Spotted Bollworm becomes rare in May, and is completely absent in June. But in localities where there are tanks and wells for irrigation, cultivators generally maintain a fruit or vegetable garden where the Spotted Bollworm finds alternative food plants, such as *Hibiscus esculentus*, *H. panduriformis*, *H. cannabinus*, Hollyhock, *Abutilon*, or perennial cotton trees, to carry on its existence through the critical period. Again, in big towns, like Nagpur, *Bhindi* pods are imported in fairly large quantities from far off places outside the province during June-July, and these pods are sometimes badly infected. Due to traffic facilities, they are sometimes taken into the interior also. The moths which emerge in July from the affected pods find the young cotton crop on which they lay eggs. After the close of the cotton season, some of the Pink Bollworm larvæ are found in cotton seeds, some in *kapas* of late pickings or in *kapas* which remains on cotton stalks stored as fuel, and some are found in cracks in the soil. Moths from all these emerge during June-July when reproductive forms on plants in cotton fields are not available for oviposition. Stray annual and tree cotton plants, however, harbour many Pink Bollworm larvæ during these months, but the number of such plants being very small, they are not capable of supporting pink bollworm population to an extent which will cause heavy infection of the new crop. The number of the larvae being small in the beginning of the cotton season and the rainfall and available food conditions being unfavourable, it takes the pest a long time to multiply to any appreciable extent. However, these few plants keep the pest alive and help it to bridge over the critical period between the close of one cotton season and the beginning of the next.

It is an established fact that cotton buds, flowers and tender bolls when attacked by bollworms drop off the plants with the slightest jerk. When these shed forms begin to wither and dry, the bollworm larvae leave them and

get into the plants near which they happen to lie. With a heavy shower of rain the larvae inside the shed forms are killed, as the forms get more or less drowned. If the shed forms are systematically collected and destroyed early in the morning when there has been no rain during the previous night, the crop will be benefitted, as the number of bollworms will be considerably reduced and the succeeding broods will be checked to a great extent. This method was tried during September-October in 1935 and 1936 and gave satisfactory results.

United Provinces.

32. *Scheme for Survey of Cottons in Rohilkhand and Bundelkhand.*—This scheme was started in July 1933, for carrying out a detailed survey of the *Bengals* types of cotton grown in Rohilkhand and Bundelkhand to facilitate the selection of suitable types of cotton for the different areas of the province. The scheme terminated on the 1st March 1937.

The results of the survey are briefly summarised below :—

The survey was usually started each year in the middle of September and was continued up to the middle of December. Budaun, Bareilly (part), Moradabad (including Chandausi), Nainital (part, including Kashipur), Bijnor, Rampur State in the Rohilkand Division and Banda (part), Hamirpur (including Kulpahar and Harapalpur), Jhansi (part), Jalaun (part) in the Bundelkhand Division and amongst the Central India States, Orchha, Datia, Ajaigarh, Charkhari, and Chatarpur were surveyed. Samples were collected from the produce of single plants. Selection of plants in the field crop was mainly based upon yield, density, lint length and 'feel' and care was taken to collect all the representative types constituting the bulk of the crop. The entire collections totalling 23,000 samples were studied in the Laboratory, and a preliminary selection made on the basis of lint-length, density and 'feel'. Subsequent selections were made on general habit, maturity, yield, ginning outturn, fibre and quality, etc. The constitution of the crop, though not determined by actual computations, indicated, by eye judgment, the predominance of narrow lobed yellow flowered type throughout. Next in order came the white flowered narrow lobed roseum type in Rohilkand, while the white flowered types occurred with very much less frequency in Bundelkhand; broad lobed yellow and white contributed only an insignificant share to the bulk of the crop all over.

The study of this vast collection of the material has revealed that within each defined type of *Gossypium neglectum—bengalensis, roseum, Malvensis and Cutchica*—exist sub-forms possessing varying characters.

Bengal.

33. *Comilla Cotton Scheme.*—This scheme was sanctioned in February 1933 and came into operation in December 1934. The object of the scheme is botanical and systematic study and improvement of the commercial grades

of *cernuum* cotton. During the year under review, 38 single plant selections were tried in a replicated experiment but the experiment proved a failure owing to low stand. A survey of the cottons grown in the hill tracts was undertaken with a view to selecting a suitable type for these tracts in accordance with the trade demands.

HYDERABAD.

34. *The Botanical Research Scheme at Parbhani* started work in 1929 with a view to obtaining a few prolific, high ginning, uniform types of cotton, with good spinning qualities, to replace the existing mixture of *Gaorani* cotton in Hyderabad State. *Gaorani* or *Bani* is probably the best of the indigenous cottons in respect of spinning, though it is both a poor yielder and a poor ginner.

Preliminary tests on 240 new selections of medium staple *Gaorani* and 110 selections with a slightly shorter staple were carried out at Parbhani. *Gaorani* 4B-5 was adopted as 'control' for the former and the local variety of Parbhani for the latter. From these, twenty progenies were reserved for inclusion in comparative strain tests. A similar test with 53 single plant progenies against the local variety carried out at Latur gave 30 progenies with higher yield than the control and another test with about 50 single plant progenies carried out at Madhol gave 25 progenies with higher yield. Five of these were reserved for inclusion in the comparative strain tests. As a result of selections made at Latur and Madhol, 50 plants from each locality have been finally reserved for further study. In addition to these, 300 plants from about one thousand plants selected from the cultivators' fields in the *Gaorani* Protected area and from the Cotton Research Station at Parbhani have been retained for growing in the 1938-39 season.

Varietal tests were undertaken at the Experimental Farm at Parbhani and the Variety Testing Stations at Latur and Madhol with *Gaorani* local and the improved strains of *Gaorani* 3B-1, *Gaorani* 4B-5, *Gaorani* 6, *Gaorani* 113. The results showed that all the strains gave higher yield than the local except *G.*6, the yield of which was about the same as that of the local variety.

A comparative study of the improved strains showed the superiority of *G.* 3*B*-1 and *G.*4*B*-5 in respect of both yield and spinning quality. In a second plot varietal test *G.* 12*F* was found to be superior to the other strains—*G.*3*B*-1, *G.* 113 and *Havri* 3.

A comparative test with twenty-four medium staple strains and *Gaorani Umri* was conducted at the Cotton Research Station, Parbhani, and it was found that seven strains gave higher yield than *Gaorani Umri.* A further test carried out at the Variety Testing Station, Latur, with fourteen *Gaorani* strains against the local variety showed that all the strains were superior to the local. Three strains, *Gaorani* 6E.3, *Gaorani* 58A.-1 and *Parbhani* 3A-1 gave the highest yield. A similar test carried out at Madhol against the local showed that *G.* 6*E*-3, *G.* 58-A1 and *G.* 115 gave the highest yield.

Out of the 88 strains tested for wilt resistance, 14 showing a relatively high degree of resistance to wilt, were tested against *Gaorani* 6, a susceptible type, 26 strains showing a fair degree of field resistance were grown in a highly wilt infected plot in single rows alternating with *Gaorani* 6. Those plants, which on examination showed no internal discolouration of stem, were picked individually and reserved for further study. Out of the eleven strains tested at Latur, six showed a fair degree of wilt resistance and these will be tested again.

Nearly 800,000 lbs. of seed of *G.* 6 of various generations, sufficient for about 50,000 acres was distributed in Madhol *taluka* but due to the late arrival of the monsoon and incessant rains, the estimated yield of about 6,000 bales of lint was reduced by about a third. The outturn of the unaffected area was about 200 lbs. per acre. The work of seed distribution on an area of 200,000 acres is in progress.

Punjab-American 47F, *Hyderabad American* 8 and *Parbhani American* 1 were tested against *Havri* 3, *G.* 5, *G.* 113 and two Egyptian types under irrigation. As the differences amongst the indigenous types were not significant, the experiment will be repeated.

35. *Pink and Spotted Bollworm Scheme.*—This scheme was started in January 1933 with the object of determining (*a*) the actual amount of damage done by the pink and spotted bollworms to the cotton crop in the Godavary Valley, (*b*) the progress of their attack on the growing crop in the season, (*c*) the mode of their carry-over from one season to another and (*d*) the effect of the likely control measures. The investigations carried out till the end of the 1936-37 season indicated that the two bollworms were responsible for an annual damage ranging from 25 to 33 per cent. of the harvested crop. The incidence of the attack during any one season depended upon the carry-over from the previous season and the weather conditions. The Spotted Boll-worm was found to be active throughout the year, while the Pink Bollworm made its appearance in August and was at its height in December and January. It was also observed that whereas for a successful carry-over of Spotted Boll-worm, the presence of food plants, cotton or other alternative host plants, was necessary, Pink Bollworm passed the period of interval between two seasons mostly in the resting stage in hibernaculæ spun in the fibres of seed cotton, to some extent in soil and also as short cycle generations through the hot months of May and June on some stray plants and cotton sprouts situated in irrigated sugarcane or vegetable fields. Hibernation in seed was practically absent. The control of the Spotted Boll-worm might be practicable by the observance of a strict close season, by the removal of all cotton and other alternative host plants during the off season and the ginning of all cotton by a certain date so as to destroy the caterpillars hibernating in the fibres of cotton. In order to determine the carry-over of the Pink Boll-worm through soil, experiments were laid out on the Farm and in cultivators' fields round about Parbhani and in Nanded district. The results of these experiments revealed that (*a*) some pink boll-worm caterpillars did not go into soil

for hibernation earlier than the 10th of January, (*b*) fewer caterpillars were recovered from plots growing early maturing variety, (*c*) more caterpillars were taken from the plots which were well mulched during the season than from those which were given ordinary treatment, and (*d*) more caterpillars were recovered from sub-plots in which plants were allowed to stand for longer periods.

Whilst the above results give some idea of the problem, the number of caterpillars recovered from the various sub-plots is not sufficient to warrant similar findings in the final examination of the soil in May and June. The experiment will accordingly be repeated for at least another season with both early and late maturing varieties.

36. *Boll-worm Clean-up Scheme.*—This scheme which is the outcome of the investigation conducted on the Boll-worms of cotton during the years 1931-37, was sanctioned in August 1936, but owing to administrative difficulties, it could not be put into operation before the 1st October 1937. The researches carried out at Parbhani showed that the Pink and Spotted Boll-worms of cotton were together responsible for a loss of 25 to 33 per cent. of the annual crop, the newly developed, early maturing strains of Gaorani suffering markedly less than the existing commercial variety. Furthermore, they indicated that the Spotted Boll-worm passed from one cotton to the other by continuing to breed either on cotton plants left standing in the fields after the final picking or on alternate host plants of *bhendi* and *ambadi* grown as garden crops during this period. Similarly it was found that the Pink Boll-worms either remained active on the standing cotton plants till the first week of May or went into hibernation at any time from October onwards. It was also discovered that, unlike the case in the United Provinces, the Punjab and Egypt, very few larvæ of Pink Boll-worm hibernated in seed. Most of the hibernating larvæ existed either amongst the fibres of *kapas* or in the cracks that are so characteristic of black cotton soils after the end of the rainy season. From these findings the following steps appeared the most likely means of controlling these pests :—

(1) The cultivation of an early maturing variety of cotton ;

(2) Complete removal of cotton plants from the fields as soon after the final picking as possible ;

(3) The completion of ginning of all *kapas* at least six to eight weeks before the sowing of the new crop ; and

(4) The prohibition of the growing of *bhendi* and *ambadi* as garden crops in the off season.

In order to give effect to these findings, a part of Nanded district, comprising 230 villages and having nearly 91,000 acres of cotton every year, was selected for the purpose and work started in October 1937.

The chief activities of the period under review were the complete clean up of cotton fields, the prevention of the growing of *bhendi* and *ambadi* in the off season and the completion of the ginning of all *kapas* before 1st May

1938. Intensive propaganda by means of public lectures, talks with individual cultivators, demonstrations and the like was carried out from February to April. The ginning of all *kapas* in the control area was completed before the notified date and nearly 99.8 per cent. of the 91,000 acres of cotton were cleaned up before 7th May. Success was also achieved in the prevention of growing *bhendi* and *ambadi* in the off season, but great difficulty was experienced in the execution of this part of the work because these are the principal vegetable crops of the area during this time of the year. The giving up of *bhendi* and *ambadi* Cultivation in summer depends on the finding of an alternative vegetable crop which will not only grow well in the tract but will also suit the local taste. The seed of a newly evolved early maturing strain of *Gaorani* has been distributed by the State Department of Agriculture in the current year in about a fourth of the Control Area. A study of the effects of the measures indicated above on the crop of the coming season will be made during the year 1938-39. Besides this, intensive propaganda will be carried out for the adoption of Control measures.

37. *Scheme for inclusion of Northerns and Westerns Cottons in programme of work of Dry Farming Scheme at Raichur.*—This scheme, which was sanctioned for a period of one year in March 1937 has two-fold object, *viz.*, (1) to consider the possibility of growing medium and long staple cotton in short staple areas in India, and (2) to find out how far the devising of Dry Farming methods would go hand in hand with the successful growing of such cottons in dry and low rainfall tracts of the country.

The scheme has just covered one Cotton season. Two regular experiments on 'Tillage' and 'Manures' were laid out in addition to observation plots and field scale trials of bunding. Hagari No. 1 cotton and Nandyal 14 were imported for use in these experiments. So far the experiments have not yielded significant results. This may, however, be attributed to the abnormal conditions which prevailed during the season. An intense shower giving 3.5″ of rain in one hour was received immediately after the sowings and this was followed by similar, though smaller showers in succession. This affected the germination seriously and damaged the experiments to the extent of evenising the effects of the different treatments.

The scheme has been extended for a further period of 3 years.

38. *Scheme for the improvement of Kumpta cotton.*—This scheme was sanctioned in August 1936 for a period of five years and came into operation in November 1937. Its object is the development of suitable strains of Kumpta cotton from the local variety of Raichur. The work of the year consisted largely of properly conducted comparative tests of the most promising new strains, their parent variety and two imported types of *Jayawant* and *Hagari*. Of the five strains included in the varietal tests, *Raichur Kumpta* 19 gave a significantly higher yield than the others. This strain is reported to be superior to the local variety in both ginning outturn and spinning performance. It has also shown a marked resistance to prolonged dry weather. These results, however, need confirmation.

Among the other strains tested, the most promising are the following :—

Raichur Kumpta 4
,, ,, 15
,, ,, 25
,, ,, 26 and
,, ,, 29.

The tests will be continued during 1938–39.

BARODA.

39. *Root Rot Scheme.*—This scheme which has for its object the study of the root rot disease of cotton in Baroda and the development of strains resistant to it was sanctioned in July 1931 for a period of two years and commenced work in February 1932. During the year under review, K. S. selections were tested in sand cultures in glass house in soil heavily infected with root organisms, with Broach 9 as control. The survivals from these strains will be transplanted in the root rot affected area. Crops like rice, *tur*, sannhemp, *bajri* and *variali*, which are shown in mixtures with cotton, were sown together in a sub-plot with alternate rows of cotton ; in addition, each single crop was sown with alternate rows of cotton. It was, however, observed that the protective effect of these crops on the disease was not significant. Experiments were laid out for replicated family tests of *K. S.* strains, progeny row tests, non-replicated progeny row tests, bulk trials, root study and comparative yield trials of *K. S.* against *B.* 9. From these trials, plants showing higher resistance to the disease and possessing better yielding capacity and other economic characters have been selected for further trials.

40. *Scheme for Survey of Goghari Cotton.*—This scheme was sanctioned in August 1934 for five years and came into operation in February 1935. Its object is the same as that of the Gujarat Goghari Survey Scheme, *viz.*, the elimination of *Goghari*, a short staple variety, by means of field to field survey with a view to tracing it to ginneries and inducing the latter to discourage its cultivation by paying low prices for it.

During the year under review, the cotton crop in 47,986 *bighas* was surveyed and showed a total calculated area as *Goghari* to be only 99–0 *bighas*, *i.e.*, about 0.2 per cent. The range of mixture varied from 1 to 2%, except in one field of about 9 *bighas*, owned by a cultivator, in which *Goghari* mixture was found to be 5%. The *kapas* of this field was ginned separately and the resulting seed was disposed of for feeding purposes. Out of 5,594 cultivators in 82 villages, having 47,986 *bighas* of cultivation, 520 cultivators had a mixture of *Goghari* in their fields ranging from 1 to 3% in 5,235 *bighas*, giving 99 *bighas* of *Goghari* in the area surveyed. Propaganda work was continued along the lines of the past year.

The object of the survey had been well served and, with the enforcement of the prohibition Act against *Goghari*, it is reported that the menace to the reputation of Navsari cotton has been successfully overcome.

41. *Plant Puller Propaganda Scheme.*—This scheme, which aims at the eradication of the Spotted Bollworm by the uprooting of cotton stalks by the use of plant pullers, was sanctioned in August 1934 for two years, and came into operation on the 1st January 1936.

During the year under report, the number of plant pullers sold in the Navsari District was 400 and the area handled was 1,70,000 *bighas*. The value of the pullers as a means of facilitating tillage operations is appreciated although certain prejudices against the uprooting of plants still exist. For instance, it is stated that uprooting causes (*a*) loose seed bed and subsequent poor stand of the next cotton crop, and (*b*) loss of organic matter to the soil.

42. *Scheme for improvement of Mathio Cotton at Amreli and Jagudan.*—This scheme, which was sanctioned in August 1936 for five years and put into operation on the 1st June 1937, has for its object the improvement of *Mathio* mixture in respect of yield, ginning percentage and quality, and secondly the trial at Amreli of the early strains of *Wagad* evolved at Viramgam with a view to replacing, if possible, inferior *Mathio* by early *herbaceums*. *Mathio* mixture, as at present grown in Kathiawar, consists of four main groups of *neglectum* cottons in the proportion of :

Narrow white.	Broad white.	Narrow yellow.	Broad yellow.
52	21	15	12

The ginning percentage of these varies from 21 to 40 and the fibre length from 13 to 24 mms.

Out of 35 progeny rows grown on a small scale, seven having a ginning percentage above 33 and fibre length above 18 mms. were retained for further trial. From the bulk samples collected from different centres in Kathiawar, 145 plants having a ginning percentage of 35 and above and fibre length of 18 mms. and above were selected as a foundation stock. Replicated tests of five varieties, *viz.*, *C.* 520, *N.R.*, *Banilla*, *Jarila* and *Local Mathio*, showed that *C.* 520 was promising both as regards yield and ginning percentage. *Jarila* proved to be definitely inferior to the rest in yield. Another replicated test of 5 varieties, *viz.*, *V.* 434, *V.* 438, *C.* 520, *Malvi* 1 and *Malvi* 9, showed that *V.* 434 and *V.* 438 were as good yielders as *C.* 520. These will be tested further as promising quality cottons.

The cotton work at Jagudan is confined to duplicating, on a small scale, important types of *Wagad* cotton grown at Viramgam as a precautionary measure against their chance extermination due to precarious nature of seasons at Viramgam. During the year, 27 types of *Wagad* cotton from Viramgam were maintained in pure culture. Variety trial experiments with *Wagad* 8, *Seg.* 4–1, *Seg.* 7–1 and *Local Wagad* showed that segregate 4–1 is a promising type ; it has the close-boll character of *Wagad* cotton while it gins and spins better than the *Local Wagad.*

BIKANER.

43. *Bengals Cotton Improvement Scheme.*—The opening of the Gang Canal under the Sutlej Valley Scheme resulted in the colonization of a new and virgin area, known as the Gang Canal area, with immigrant peasants, mostly from the Punjab, who were accustomed to the cultivation of the Punjab *Desi* and *American* types of cotton. These cultivators found it difficult to successfully cultivate cotton under local conditions, evidently because the new environment was not quite the same as they were accustomed to in the Punjab. It was even feared that the area under cotton would be seriously reduced. This scheme was, therefore, started in January 1931, for the purpose of studying the local problems of the agriculturists and for obtaining by selection and hybridisation one or more superior types of cotton suitable to the locality. Until 1934, the botanical work was confined to the testing out of a large number of outside varieties, both *desi* and *American*. After that year, however, extensive survey of the Rajputana tract was undertaken to collect breeding material; at the same time, extensive trials of the few selected cottons from outside were continued to test their suitability to the tract. Agronomic work was pursued intensively from the beginning of the scheme. At the end of the first five years, it was found that *Cwn.* 520 was the most profitable cotton to grow in the tract and that *American* cottons were generally unsuitable because of their low yield and susceptibility to diseases. The staple of *Punjab-American* cottons was found to deteriorate both in length and strength when grown under Ganganagar conditions. A large amount of data and useful information regarding sowing times, seed rate, frequency and distribution of irrigation, optimum spacing for the *desi* and *American* cottons, rotation and manuring have also been collected.

Since 1934, greater attention has been paid to selection and breeding problems and the results obtained so far are summarised below:—

(1) Re-selection in *Cwn.* 520, has yielded strains which show much better germination and possibly also a little higher yield than *Cwn.* 520.

(2) Some of the local selections have proved better yielders than *Cwn.* 520, but are poorer in quality.

(3) It appears doubtful whether mere selection would improve the quality of the *desi* cotton.

(4) Breeding tests have shown that there are possibilities of improving the quality by hybridization. As regards cottons that may be used as parents, the set *Cwn.* 520 x *Bani* appears to offer the best chances of achieving the desired results.

(5) For the last two years *P. A.* 289*F* has done as well as *Cwn.* 520 but it suffers from immaturity of the seed.

(6) In a variety cum agronomy experiment, interesting results have been obtained which show that the *desi* cotton (*Cwn.* 520) can respond as well as the *American* to more favourable conditions—liberal watering and manuring, etc.

MYSORE.

44. *Mysore (Doddahathi) Cotton Scheme.*—This scheme was sanctioned in February 1935 and came into operation in November 1935. It has for its object the breeding of suitable types from the local (*Doddahathi*) or *American* cotton which would be resistant to the 'Red Leaf' disease which stands in the way of expansion of this crop in the Irwin Canal area in Mysore State.

During the year under review, five new selections have shown great resistance to "Red Leaf" disease. About 3,000 crosses were made and these were either back crossed or crossed with promising hybrids. The two hybrids, *Co.* 2 x *Uganda F.* 3 and *Co.* 2 x *Sea Island* back crossed thrice with *Co.* 2, gave interesting results. Seeds of *Co. 2*, which had been X-rayed for 7½ minutes and selfed, have now, in their third generation, given plants with a ginning percentage of 38 to 40 and a lint length of 25 to 28 mm. as compared with the ginning percentage of 33 to 35 and lint length of 20 to 23 mm. of unexposed *Co.* 2. These plants are reported to be almost free from "Red Leaf" disease. Good yields were obtained from the bulk trials of *M.A.* 2 and *Co.* 2 for multiplication of seed, the first strain yielding 633 lbs. and the second 424 lbs. of seed cotton per acre.

45. *Joint scheme for estimation of effects on cotton crop of use of plant pullers in Bombay Presidency and Baroda State.*—This scheme was sanctioned in August 1936 and came into operation in December 1936. Its object is to obtain an exact or as nearly exact as possible an estimate of the benefits derived from the use of the plant puller. The results of the investigations both in the Bombay Presidency and the Baroda State have shown that on an average the yield of each plot in the "pulled" area was better than that of the plots in the "unpulled" area.

RESEARCH STUDENTS.

46. From the time of its inception, the Committee has undertaken the training of research workers in the various branches of science pertaining to cotton. Distinguished graduates are selected and placed for training under experienced research workers on the Committee's schemes in the provinces, at the Institute of Plant Industry, Indore, the Committee's Technological Laboratory, or under Agricultural Officers, or Professors in Indian Universities or they are sent abroad. The term of scholarships is usually two years but extensions are sometimes sanctioned, if found necessary.

Scholarships are awarded under two categories, *viz.*, Training Grants and General Scholarships. The former are intended for Government servants who are recommended by Provincial Governments and for employees of the Committee who are considered suitable. General Scholarships are awarded to University Graduates. Applications for this class of scholarships are invited by advertisement.

Fifty-four scholarships and nine training grants have so far been awarded by the Committee ; out of these, one scholarship and six training grants were for foreign study. During the year under report, six research students were under training five in India and one abroad. One training grant for studies abroad was awarded during the year.

Expenditure on Research Studentships up to 31st August 1938 amounted to Rs. 2,68,335.

CHAPTER III.

SEED DISTRIBUTION AND EXTENSION SCHEMES.

47. During the first five years of its existence, the Committee devoted itself chiefly to botanical and other research on cotton, but in 1929 it decided to enlarge the scope of its activities and to pay especial attention to the practical aspect of research by taking definite steps to make the results available to the cultivator. From that time, therefore, the Committee adopted the policy of helping Agricultural Departments and Co-operative Sale Societies in the more extended distribution of pure seed of improved varieties of cotton. At the commencement of the period under review there were 13 seed distribution and extension schemes in operation. During the year, however, five new schemes were sanctioned, two for the maintenance of nuclei of pure seed of improved varieties of cotton in the Presidency of Madras and the Central Provinces and Berar, one for financing seed distribution in Sind, one for the distribution and marketing of *buri* 107 cotton in the Burhanpur *Tahsil*, Central Provinces, and one for the extension of *B. D.* 8 cotton in the Baroda State. A short account of the various seed distribution and extension schemes which were in operation during the year in the different provinces is given in the following paragraphs.

MADRAS.

48. *Tiruppur and Co.* 2 (*Cambodia*) *Schemes.*—The Madras (Tiruppur) Seed Extension Scheme was sanctioned in 1929 for a period of five years with the object of providing for the pay of an officer to act as an adviser to a group of Co-operative Societies in Coimbatore district which were growing improved strains of *Cambodia* cotton and also to help the Agricultural Department in their seed distribution work. It started work in May 1931 and was extended in August 1936 to the 14th September 1937. The total cost involved amounted to Rs. 24,940. This scheme was amalgamated in 1933 with a new scheme, known as the Tiruppur *Co.* 2 (*Cambodia*) Seed Extension Scheme, which was sanctioned in August 1932 for a period of five years for the distribution of *Co.* 2 seed in the Salem and Coimbatore districts through the agency of the Madras Agricultural Department and the Tiruppur Co-operative Trading Society. The object of the second scheme was the maintenance by the Agricultural Department, with a grant from the Committee, of a seed multiplication area of not less than 6,000 acres, and the distribution by the Society to the cultivators of the pure seed produced in this area for 1,00,000 acres. The Committee further guaranteed the Tiruppur Co-operative Trading Society its actual loss on seed transactions up to a maximum of 10 per cent. of the capital invested for the purchase of seed and interest thereon at 5 per cent. Both the schemes

were due to terminate on the 14th September 1937, but they actually closed down on the 17th August 1937. The following table shows the acreage under seed farms and production during the last five years:—

Year.	Actual area under seed farms in acres.	Production of seed in *maunds*.	Sufficient to grow acres (approximately).
1932-33	1,739	19,944	20,000
1933-34	4,122	29,596	50,000
1934-35	5,152½	53,545	54,000
1935-36	5,320	45,995	46,000
1936-37 and 1937-38 up to 17th August 1937	5,117.23	34,947	35,000

The gain to the cultivators during the period of operation of the schemes has been estimated at nearly Rs. 70,84,900.

49. *Maintenance of nucleus of pure seed of improved varieties of cotton Co.* 2 *H.* 1 *and K.* 1.—This scheme was sanctioned by the Committee in January 1938 at an annual cost of Rs. 610 for a period of five years, but was not put into operation during the year under report.

BOMBAY.

50. *Surat Scheme.*—This scheme was first sanctioned in 1929 for two years and was extended in 1931 for another two years pending final decision of the Committee on the cotton policy in the Surat area. In January 1934, after a thorough examination of the merits of 1*A* and 1027 *A.L.F.*, the Committee finally decided in favour of the latter and extended the scheme for five years for the distribution of 1027 *A.L.F.* seed in the Surat area. The scheme is due to terminate in March 1939. The total amount so far sanctioned for the scheme is Rs. 96,050. During the year under review, the Department of Agriculture controlled a seed multiplication area of 26,618 acres (including 1,160 acres grown with farm pedigree seed) against 25,583 acres (including 1,589 acres grown with farm pedigree seed) in the previous year, and distributed 29,36,110 lbs. (including 16,60,449 lbs. supplied to Indian States) against 26,87,009 lbs. (including 14,77,946 lbs. supplied to Indian States) in the previous year.

51. *Khandesh (Jarila) Scheme.*—This scheme, which has for its object the extension of *Jarila* cotton in place of *Banilla* in the Khandesh area, was sanctioned in March 1937 for a period of ten months from 1st May 1937 and was extended in January 1938 for a further period of one year up to 28th February 1939. The total sanctioned expenditure on the scheme to be met from the funds of the Committee amounts to Rs. 24,828. From the produce

of the Bhadgaon and Jalgaon farms and 392 acres of approved cultivators' fields in 8 villages in East and West Khandesh, 84,315 lbs. of seed have been made available for multiplication over an area of 4,000 acres under controlled conditions during the next season. The expansion of area by natural spread is estimated at 4,000 acres. The corresponding figures for the last year were 520 acres under controlled conditions and 575 acres by natural spread. Village trials have shown that *Jarila* gives a significantly higher yield than the local variety. This cotton is reported to have a staple length of 0.84″ to 0.92″ and a spinning performance of 28 to 36 standard warp counts, against a staple length of 0.63″ to 0.68″ and spinning performance of 6 to 7½ standard warp counts in the case of the local variety. The *Jarila* cotton produced at different centres was pooled together at Jalgaon and Bodwad centres, ginned under departmental supervision and sold by auction at a premium of Rs. 26 to Rs. 46 over *Broach.*

52. *Deccan Canals* (*Banilla*) *Scheme.*—This scheme for the supply of pure *Banilla* cotton seed for the Deccan Canals area was sanctioned in January 1934 for five years and started work in April 1934 on the Government Farm at Kopergaon. The present sanctioned period of the scheme is due to terminate on the 31st March 1939. Unlike other seed schemes, this scheme was expected to be self-supporting but contrary to expectations, a net loss of Rs. 798 is anticipated at the close of the year under review. During the year under report, 31 acres were under cotton and 29 acres under groundnut at the Kopergaon Government Farm. A very poor yield of 368 lbs. of *kapas* per acre was obtained against 678 lbs. per acre of the previous and 733 lbs. per acre of the year before. The reason for this was reported to be the uneven distribution of rainfall, attack of green caterpillars, pink bollworm and growth of weeds.

53. *B. D.* 8 *Scheme.*—This scheme for the distribution and extension of *B. D.* 8 cotton was sanctioned in August 1935 for a period of 3 years and commenced work in December 1935. It was extended in July 1938 for a further period of five years, the total grant sanctioned for the scheme being Rs. 47,501. During the year under report, an area of 6,268 acres was under *B. D.* 8 as against 20,012 acres in 1936-37. The reason for this fall in area was reported to be the excessive rains at the beginning of the season. Out of 2,035 bales of pure *B.D.* 8 produced, 1,770 bales were sold through sale societies and gin-owners. *B. D.* 8 realised Rs. 3, to Rs. 4, more per *bhar* (1,020 lbs.) than *Goghari kapas*, against Rs. 2 to Rs. 7 less per *bhar* during the previous year. There were 495 acres under pedigree seed supplied by the Surat and Broach Farms from which 130,360 lbs. of seed were obtained. These, together with a quantity of 4,120 lbs. obtained from the Surat and Broach Farms, will be given to registered seed growers and the Amod Cotton Sale Society for seed multiplication to meet the demand which is reported to be keen. This can be gauged from the fact that already 76,800 lbs. of seed have been distributed.

54. *Revised Jayawant and Gadag No.* 1 *Scheme.*—This scheme replaced five schemes in the Southern Division of the Bombay Province, *viz.*, the Hubli, Gadag, Athani, Haveri and Bailhongal Seed Distribution and Extension

Schemes. It commenced work on the 1st June 1936 and is due to terminate on the 31st May 1941. Twenty-five per cent. of the net cost of the scheme, excluding savings from the five schemes replaced, is being borne by the Bombay Government. The scheme is designed to embrace not only the areas covered by the five schemes mentioned above but also other areas in the Dharwar, Belgaum and Bijapur districts, for which no specific schemes have been sanctioned. The scheme is operated from seven centres, *viz.*, Hubli, Haveri, Navalgund, Bailhongal, Athani, Bijapur and Bagalkot, through the agency of Co-operative Societies but under the general control of the Agricultural Department. Decentralization is the keynote of the scheme, the idea being that no single agency should have too great an area to cover or too great a responsibility to shoulder. The scheme is intended to cover, within five years, 9½ lakhs of acres with the improved varieties. During the year under report, 27,55,200 lbs. of pure *Jayawant* seed were sown over an area of 2,45,318 acres, against 9,61,100 lbs. of seed sown over an area of 1,02,306 acres last year. The natural spread of *Jayawant* was estimated to be 1½ lakhs acres, bringing the total area under this variety to about 4 lakhs acres. 12,95,700 lbs. of pure *Gadag No.* 1 seed were sown over an area of 92,539 acres, against 8,44,100 lbs. of seed sown over an area of 84,410 acres last year. The natural spread of this variety was estimated at 25,000 acres, making a total of 1,17,539 acres. 28,66,920 lbs. of *Jayawant* seed sufficient for about 3 lakhs acres, and 15,88,580 lbs. of *Gadag No.* 1 seed, sufficient for about 1,13,470 acres, have been purchased so far for the 1938-39 season.

The cultivators' produce was pooled together and sold by auction at different centres and sub-centres. In all 14,940 *docras* of *Jayawant* and 13,569 *docras* of *Gadag No. 1* were sold during the year, and the extra profit realized by cultivators is estimated at about Rs. 37,350 and Rs. 73,000, respectively.

55. *Scheme for maintenance of nucleus of pure seed of improved varieties of cotton.*—In pursuance of the policy of the Committee to maintain a nucleus of seed of all approved varieties of cotton, a scheme for the maintenance of nucleus of each of the following seven varieties of cotton was sanctioned in August 1937 at a total cost of Rs. 2,660 per annum (*i.e.*, Rs. 380 per variety) and it came into operation during the season 1937-38 :—

(1) 1027 *A.L.F.*

(2) *B.D.* 8.

(3) *Jarila* (wilt free zone).

(4) *Jarila* (wilt zone).

(5) *Jayawant.*

(6) *Gadag No.* 1.

(7) *Banilla.*

CENTRAL PROVINCES AND BERAR.

56. *Verum Seed Distribution and Marketing Scheme.*—In November 1929, the Committee sanctioned, for a period of one year in the first instance, the Central Provinces *Verum* Seed Distribution and Extension Scheme. It started work in September 1930 and was extended annually up to the end of July 1934, when it was combined with the then newly sanctioned scheme for the extension of long staple cottons in the Central Provinces. The combined scheme, which was sanctioned for five years from the 16th June 1934, is known as the 'Scheme for the Extension of Long Staple Cottons and Marketing of *Verum* cotton in the Central Provinces and Berar.' At the meeting of the Indian Central Cotton Committee held in July 1938, the scheme was extended for a further period of three years, the title being changed to 'Scheme for the Extension and Marketing of *V.* 434 cotton.' The total grant sanctioned by the Committee for the scheme amounts to Rs. 3,70,444.

During the year, the Agricultural Department distributed 4,233 *Khandies* of pure seed of improved strains (sufficient to cover an area of about 87,649 acres) as against 5,594 *Khandies* of pure seed distributed in 1936-37. 4,575½ bales of pure cotton were disposed of at an average premium of Rs. 39-15-0 on *Broach* and Rs. 57-7-0 on *Oomras*, against Re. 1-3-0 on *Broach* and Rs. 19 on *Oomras*, in the previous year. The drop in the area covered during the season under report was mainly due to the exceptionally low premium of Re. 1-3-0 on *Broach* and Rs. 19 on *Oomras* obtained for *Verum* during the previous season.

57. *Distribution and Marketing of Buri* 107 *cotton in Burhanpur Tehsil.* This scheme aims at introducing *buri* 107—a selection from acclimatised *Gossypium hirsutum*—in the 30,000 acres now under mixed local *buri*, in the course of the next three years. The scheme was sanctioned by the Committee in July 1938, for a period of three years at a total estimated cost of Rs. 19,535, of which the share of the Committee amounts to Rs. 15,300 on account of the cost of staff. The scheme has not yet been put into operation.

58. *Maintenance of nucleus of pure seed of improved strains of cotton.* This scheme for the maintenance of a nucleus of seed for each of the cotton strains, *V.* 434, *Late Verum, No.* 438 and *buri* 107, was sanctioned by the Committee in July 1938 at a total cost of Rs. 7,000 spread over a period of five years and will come into operation from next year.

UNITED PROVINCES.

59. *C.* 402 *Scheme.*—This scheme, which was sanctioned in January 1934, for a period of five years, at a total estimated cost of Rs. 45,800, for the distribution of *C.* 402 seed in the Hardoi, Lucknow and Sitapur districts of the United Provinces, commenced work in May 1935. Though superior to the local cotton *C.* 402 requires more careful cultivation and it was therefore decided early in 1935 to restrict its distribution to Madhoganj and Bilgram *tehsils* only, where it gives satisfactory results without extra labour and to

extend, in the remaining areas covered by the scheme, another variety *C.* 520, which is better suited for them than *C.* 402. During the year, the total area under *C.* 402 and *C.* 520 dropped to 1,898 and 362 acres, respectively, against 2,619 and 1,000 acres in 1936-37. The scheme was closed down on the 15th February 1938 as it was felt that the area under *C.* 402 was not likely to expand to an extent that would justify further money being spent on it. The net gain to the cultivators from the scheme during the three-year period of its operation is estimated at Rs. 27,000.

SIND.

60. *The Sind Seed Distribution and Extension Scheme* commenced in April 1931 and on the expiry of its first sanctioned period of 3 years, it was extended for a further period of 5 years. The total grant sanctioned for the scheme amounts to Rs. 3,89,540. The work of the past seven years has definitely proved that the Right Bank area of the Indus is as suitable as any other part of Sind for growing long staple cotton and it is now proposed to pay special attention to seed distribution, the introduction of better methods of cultivation, and the extension of cotton in lands under the Barrage area. Cotton cultivation was unknown on this side of the Indus before the commencement of this scheme, but as a result of intensive propaganda carried out by means of field demonstrations, shows, public meetings, etc., the area under cotton, during the year under report, had gone up to 51,500 acres (including 7,000 acres under natural spread), 45,000 acres being under 4*F*–98 and 2,000 acres under Sind *Sudhar*. In the previous year the area under improved varieties was 41,020 acres (including 1,500 acres under natural spread). The Agricultural Department distributed 14,490 *maunds* of 4*F*–98, Sind *Sudhar* and *Sea Island* varieties against 14,060 *maunds* of 4*F*–98 and Sind *Sudhar* in the previous year. 16,800 maunds of 4*F*–98 seed, sufficient for about 61,000 acres, and 1,200 *maunds* of Sind *Sudhar* are available for the next season. It is reported that owing to shortage of irrigation water some rice areas are changing over to cotton cultivation.

On the Left Bank, attention is largely devoted to seed distribution and extension of improved varieties of cotton and the introduction of better methods of cultivation. During the year under report, 4,45,000 acres were under Sind *N.R.* and Sind *Sudhar*, against 4,00,000 acres last year. 2,908 maunds of Sind *N.R.*, 11,569 *maunds* of Sind *Sudhar*, 500 *maunds* of 4*F*–98, and 200 *maunds* of Egyptian were distributed during the year, against 3,685 *maunds* of Sind *N.R.*, 21,586 *maunds* of Sind *Sudhar* and 812 *maunds* of *Egyptian*, last year. 9,000 *maunds* of Sind *N.R.*, 33,050 *maunds* of Sind *Sudhar*, 150 *maunds* of 4*F*–98 and 100 *maunds* of *Egyptian* are available for sowing in the next season. In order to obtain a supply of pure seed, the Sind Government have established a ginning factory at Mirpurkhas, where the produce of Government farms and of a few selected growers is ginned. During the year under report, 13,000 *maunds* of *kapas* were ginned and sold under the supervision of the Agricultural Department. It has also been stated that the cultivators realise annas 8 to rupee one more per *maund* of *kapas* than the local rate by getting their produce ginned at the Government ginning factory and by selling the lint and seed separately.

61. *Scheme for maintenance of nucleus of pure seed of improved varieties of cotton.*—In pursuance of the policy of the Committee for the maintenance of a nucleus of seed of all varieties of cotton, the spread of which has been approved by it, a nucleus scheme for the following five varieties of cotton was sanctioned in August 1937 at an estimated cost of Rs. 2,500, per annum, spread over a period of five years :—

(1) Sind *N.R.*

(2) Sind *Sudhar.*

(3) *4F–98.*

(4) *Sea Island* 2–4.

(5) *Boss III–16.*

62. *Financing of seed distribution.*—The Committee at its meeting held in January 1938, sanctioned the financing of seed distribution in Sind for a period of three years, at an estimated cost of Rs. 45,000 per annum to be borne by the Committee and Rs. 15,250 per annum by the Sind Government. The scheme was sanctioned subject to the condition that it should not be put into operation until the rules under the Cotton Ginning and Pressing Factories (Bombay Amendment) Act were brought into force. At the request of the Sind Government the scheme has been postponed for one year.

Hyderabad State.

63. *The Hyderabad Scheme* was sanctioned in November 1929 and started work in March 1930. It was extended for three years in January 1933, and subsequently for a further period of six months up to the 31st August 1936. In August 1936, the Committee sanctioned a further extension for four and a half years, subject to the condition that at least fifty per cent. of the cost should be met by the State. The total grant sanctioned by the Committee towards the cost of the scheme amounts to Rs. 61,265. During the first two years of the operation of the scheme, *Dharwar No.* 1 and *Gadag No.* 1 seeds were distributed, but as a result of the experiments conducted by the Hyderabad Agricultural Department, and, in view of the fact that the Bombay Agricultural Department had found the *Jayawant* variety more suitable for the neighbouring areas of that province, the distribution of *Dharwar No.* 1 seed was discontinued in 1931-32 in favour of *Jayawant.* The practice in previous years was to obtain seed from the Hubli and Gadag Co-operative Sale Societies, but since 1936-37 the seed required is secured locally from selected growers in the Kumpta Protected Area of the Raichur District. The total quantity of *Jayawant* and *Gadag No.* 1 seed distributed during the year under report amounted to 2,63,945 lbs., sown over an area of 21,092 acres, against 3,74,633 lbs. sown over an area of 13,871 acres, last year and 5,53,880 lbs. on an area of 41,256 acres, in the year 1935-36. To procure pure seed of the improved

varieties for distribution in the ensuing season, the Agricultural Department carmarked a reserved area of 3,500 acres in the Kopbal and Yelburga *talukas* which was sown, rogued and supervised by the staff. This area is expected to yield 3,60,000 lbs. of pure seed sufficient for sowing 26,000 acres in the coming season.

The Kopbal Co-operative Cotton Sale Society, which was started in 1932, co-operates with the Agricultural Department in the production and acquisition of pure seed. It also undertakes the grading of cotton, advances loans to the cultivators and holds auctions. Owing, however, to the fact that better prices are obtained at the neighbouring well-established markets of Gadag and Bellary, about 75 per cent. of the cotton produced is taken to these markets for sale instead of to the Kopbal market.

Baroda State.

64. *The Baroda (Navsari Seed Storage) Scheme* was sanctioned in February 1933 for a period of five years for the rapid spread of 1027 *A.L.F.* in the Baroda territory, and started work in April 1934. At its meeting in July last, the Committee sanctioned the extension of the scheme for a further period of five years. The total grant sanctioned by the Committee towards the cost of the scheme amounts to Rs. 55,488. During the year under report, 21,830 lbs. of seed raised from pedigree seed were secured under the supervision of the Department and of this 21,675 lbs., were issued to ' A Class ' growers for sowing on an area of 2,500 *bighas*. From the controlled area of 2,506 acres of ' A Class ' growers and 3,544 acres of ' B Class ' growers, 12,55,727 lbs. of 1027 seed were produced, out of which 4,47,680 lbs. were distributed to ' B Class ' growers for sowing on an area of 13,194 *bighas*. The approximate area under improved seed during 1937-38 was about 75,000 acres. In the past, the Baroda seed organisation had no farm-grown seed for supply to ' A Class ' growers, but last year the Baroda Government opened a seed farm of about 70 acres near Vesma, a village about 8 miles from Navsari, to serve as a nucleus from which ' A Class ' growers would receive their seed. During the year under report, 700 lbs. of pure seed, secured from the Surat Agricultural Farm, were sown over an area of 52 *bighas* at the Vesma Farm and 93 *bighas* at Parthan by two selected growers. The seed from these areas will be distributed to specially selected ' A Class ' growers. To secure better prices for 1027 A.L.F. cotton, a marketing office was opened at Surat in February 1938. Certificates of purity for 559 cotton bales, ginned under the supervision of the Department, were issued. Most of this cotton was sold at a premium ranging from Rs. 3 to Rs. 11 per *khandy*.

65. *B.D. 8 Cotton Scheme.*—This scheme, which has for its object the extension of *B.D.* 8 cotton in the Baroda district, was sanctioned by the Committee at its meeting in July 1938, at an estimated cost of Rs. 34,900 of which the share of the Committee is to be Rs. 17,300, spread over a period of five years. The scheme has not yet come into operation.

66. Since 1929, the undermentioned Seed Distribution and Extension Schemes financed by the Committee have closed down after completion of their sanctioned period. The work done under these schemes has already been reviewed in previous reports of the Committee.

Madras Presidency :—

(1) H. 1.

Bombay Presidency :—

(2) Hubli.

(3) Gadag.

(4) Gadag Supplementary.

(5) Athani.

(6) Khandesh (Banilla).

Punjab :—

(7) Lyallpur (Ginnery).

CHAPTER IV.

STATISTICS.

67. India is the world's second largest producer of cotton and the role which this crop plays in the agricultural and national economy of the country cannot be over-estimated. It is one of the principal agricultural commodities entering into the export trade of India, while as a money crop, it is the mainstay of a considerable section of the agricultural population. The need for reliable statistics of Indian cotton—the quantities of cotton of different staples and qualities produced in the country, the quantities exported or used by Indian mills, figures of extra-factory consumption and stocks of Indian cotton held at different places—is fully recognised and considerable time and attention are now devoted to making this aspect of our work as complete and useful as possible. Bulletins and leaflets are issued from time to time giving all the available information which it is possible to collect and compile. A brief review of the work done during the year in connection with the collection, compilation and dissemination of statistics relating to Indian cotton is contained in the following paragraphs :—

68. *Changes in yield and character of Indian cotton crop.*—The total area under cotton in India during the year under review was 25,583,000 acres. Of this, for India as a whole the ascertained area under improved strains of cotton was 5,537,000 acres or 22 per cent. of the total. That there has been a definite improvement in the yield per acre in India in recent years is shown by Table I given in *Appendix V*. There is little doubt that this increase is in large measure due to the gradual application into agricultural practice of the results of research carried out under the auspices of the Indian Central Cotton Committee and the Provincial Departments of Agriculture—better seed, better manuring, better cultivation, clean farming and judicious rotations. It will be seen that the average yield per acre in the quinquennium 1933-38, for the whole country, is 8 per cent. higher than for the quinquennium 1928-33. The combined efforts of the Indian Central Cotton Committee and the Provincial Departments of Agriculture have also resulted in a marked change in the character of the Indian crop. This is illustrated in Table II given in *Appendix V*.

69. *Cotton Crop Estimates.*—By arrangement with the Director-General of Commercial Intelligence and Statistics, Calcutta, the estimates of the cotton crop were received by wire and released simultaneously both in Bombay and Calcutta at a time previously fixed.

The area under cotton in India rose to 25,583,000 acres during the year from 24,759,000 acres in 1936-37, the increase being recorded mainly in the Hyderabad State, the Punjab, the Central Provinces and Berar, and Sind.

The total estimated outturn for 1937-38 was 5,663,000 bales of 400 lbs. each against 6,204,000 bales in 1936-37, the average yield per acre being 89 lbs. and 100 lbs., respectively. The drop in yield per acre was reflected principally in the cotton tracts of the Punjab, Sind and the Central Provinces and Berar, which registered reduced total outturns in spite of increased acreage. Unfavourable weather conditions were mainly responsible for this. The quantity of cotton pressed including loose cotton consumed in mills in India during the year and extra-factory consumption of cotton taken at 450,000 bales amounted to 6,332,000 bales of 400 lbs. each.

70. *Improvement of Cotton Forecasts.*—Under the Bombay Cotton Forecast Improvement Scheme sanctioned by the Committee in 1934, practical steps have been taken for the improvement of the accuracy of the cotton forecasts of India. The scheme, which embraces the Bombay Province (including Indian States) and Sind, was put into operation in June 1934 and will terminate in December 1939. It is estimated to cost Rs. 34,352. The enquiry has brought to light several discrepancies in the manner of estimating the area, anna valuation and standard yield of cotton and remedial measures have been suggested or adopted to rectify them as far as possible. The standard yield figures for the cotton growing districts and Indian States in the Bombay Province were revised in the light of available information relating to actual crop and acreage and the revised figures have been given effect to from the forecasts of 1937-38 season.

A sum of Rs. 1,500 was sanctioned for a statistical examination of the data available with the Punjab Agricultural Department with the object of revising the standard yield figures for cotton in the Punjab.

One of the factors involved in estimating the accuracy of the all-India cotton forecasts is the quantity of cotton utilised for such domestic purposes as hand-spinning and the making of quilts, mattresses, cordage, padded apparel, etc., known generally as extra-factory or village consumption, for which a conventional estimate of 750,000 bales for the whole of India was adopted. The desirability, however, of verifying the accuracy or otherwise of this estimate had long been felt, and for this purpose sample enquiries in representative areas were accordingly undertaken in nine Provinces and States. The results have been recorded in a report which has been published separately. It need only be stated here that on the basis of the enquiries conducted, the estimate for the extra-factory consumption of cotton has been tentatively reduced to 450,000 bales of 400 lbs. each. No high degree of statistical accuracy, however, is claimed for this estimate, though it is believed to be much more reliable than the conventional estimate previously adopted.

The Cotton Forecast Improvement Sub-Committee of the Indian Central Cotton Committee conducts a *post-mortem* examination of the all-India cotton forecasts at the close of each year and, as a result, several sources of error have been discovered and remedial measures suggested for their improvement. During the year under report, the examination of the accuracy of the all-India cotton forecasts of 1936-37 brought to light a recurring under-estimation in

the forecasts of the Central India and Rajputana States and the question of improving the forecasts of these States is now being tackled in co-operation with the Director-General of Commercial Intelligence and Statistics by personal discussion with the forecasting authorities of the States concerned.

The question of revising the standard yield figures for cotton to ensure that they reflect present conditions has also been engaging the attention of the Committee. In this connection the desirability or otherwise of using the method of actual crop divided by the area in preference to the usual method based on the results of scientifically planned crop-cutting experiments, which involved enormous labour and cost, came up for consideration and, in view of the issues raised, the matter was referred to Professor R. A. Fisher for opinion. As the view expressed by him was that annual crop-cutting experiments designed on a randomised basis were essential for fixing the standard yield figures, it has been suggested that the major cotton-growing Provinces and States should put up proposals for conducting crop-cutting experiments over a series of years in a single district. At the same time, it was felt that the method of actual crop divided by the area had practical advantages and should be continued. The desirability of having complete figures of road-borne traffic for this purpose was emphasised. Estimates of the cost involved in collecting these statistics for those trade blocks in which such traffic is important, have accordingly been called for from the Provinces and States concerned.

71. *Report on the accuracy of the all-India cotton forecasts.*—The second issue of this Report pertaining to the season 1936-37 was published in July.

72. *Staple Length of the Indian Cotton Crop.*—As usual, a report on the estimated annual production of Indian cotton according to staple lengths was issued in May. In this report, the trade estimates of the crop were also presented.

73. *Statistics of Cotton pressed.*—Under the Indian Cotton Ginning and Pressing Factories Act, 1925, every pressing factory in British India is required to furnish to the prescribed authority weekly returns of the number of bales pressed in it. It is gratifying to record that all Indian States having pressing factories have willingly co-operated in this matter, and have enacted legislation or executive orders whereby presses located in States are also required to submit similar returns. The all-India figures of cotton pressed are published weekly in the *Indian Trade Journal.*

In addition to the publication of the above figures in running bales, their equivalents in statistical bales of 400 lbs. net are compiled by the Director-General of Commercial Intelligence and Statistics and published monthly in the *Indian Trade Journal.*

During the season 1937-38, 3,915,625 bales were pressed in British India and 1,634,882 bales in Indian States, making a total of 5,550,507 bales for the whole of India; the corresponding figures for the preceding season were 4,401,879, 1,924,950 and 6,326,829 bales, respectively.

74. *Loose (Unpressed) Cotton Statistics.*—The whole of the Indian cotton crop is not covered by the statistics of cotton pressed, as apart from the quantity utilised for extra-factory consumption, chiefly in the form of *kapas*, mills situated in the heart of cotton-growing areas often use considerable quantities of loose (ginned but unpressed) cotton. From 1936-37, however, these statistics are collected under statute by an amendment of the form of return submitted by mills under the Indian Cotton Cess Act, 1923. Similar information for Indian States is obtained voluntarily through the courtesy of the Durbars concerned. During the year 437,454 bales of 400 lbs. each of loose cotton were consumed in mills in India against 465,215 bales in the preceding year. The relevant figures for 1926-27 to 1937-38 are shown in *Appendix VI* to this report.

75. *Consumption.*—Figures for consumption of Indian cotton in mills in British India and Indian States were published monthly as in the past. The year witnessed a marked activity in the Indian mill industry, the season's total consumption* of Indian cotton in mills in India reaching the peak figure of 2,993,839 bales of 400 lbs. each, against 2,631,296 bales in 1936-37 (including Burma up to 31st March 1937). The fall in prices of cotton coupled with Japan's preoccupation with the war in China probably contributed to the increased consumption during the year. With the exception of the United Provinces, where the mill industry in Cawnpore was affected by a prolonged strike, consumption in all other Provinces and Indian States was at a higher level than in the preceding year. Of the increase, 62 per cent. was in the Bombay Province and 26 per cent. in Indian States.

According to the statistics published by the International Federation of Master Cotton Spinners' and Manufacturers' Associations, the world's estimated total mill consumption of Indian cotton amounted to 5,863,000 bales during the year ending 31st July 1938, against 6,022,000 bales during the corresponding period of 1937.

76. *Exports.*—The exports of Indian cotton during the season totalled 2,100,095 bales of 400 lbs. each, against 4,267,267 bales during 1936-37. In spite of fall in prices during the year, the parity (price of Indian cotton expressed as a percentage of American) was unfavourable to Indian cotton. The position was further accentuated by a steep decline in the takings by Japan, India's chief customer, owing to exchange and other restrictions in that country. The taking of Indian cotton by mills in the United Kingdom amounted to 362,000 bales, against 587,000 bales in the previous year. As India's cotton exports consist mainly of short staple types, it is satisfactory to note that recent improvements in technique resulting from the work of the Shirley Institute and the Lancashire Indian Cotton Committee have indicated distinct possibilities for the utilisation of such cottons in the United Kingdom, and it is to be hoped that these experiments will pave the way to definite new outlets for Indian cotton.

77. *Stocks.*—As in the past, mills, trade associations, market committees and other authorities gave every assistance in the collection of figures for stocks of cotton held in the country at the end of the season. Attempts are,

* Appendix VI.

however, still being made to extend the scope of the census of stocks, as much ground remains to be covered before a high degree of completeness can be claimed for these statistics. The information collected in respect of the stocks held on the 31st August 1938 is contained in *Appendix VII.*

The season adopted for the cotton crop of the Madras Province is the year ending 31st January, but from the 31st January 1937 arrangements have been made with the Director of Agriculture, Madras, for the collection of figures for mill and trade stocks of all cotton held in the Madras Province on the 31st August as well as on the 31st January of each year. The relevant figures for the 31st January 1938 together with comparative details for the previous years, as far as available, are given in *Appendix VII.*

78. *Demand for various types of Indian cotton.*—As the export demand and Indian mill requirements for the various types of Indian cotton play an important part in shaping and directing the cotton policy of the country, attempts are made to collect the relevant data on a voluntary basis from exporters and mills. The statistics collected for the year 1937–38 are contained in Statistical Leaflets Nos. 4 and 3 (1937–38), which are reproduced in *Appendices* VIII & IX. The period 1933–38 has seen important developments in the Indian textile industry, resulting in increased takings of Indian cotton and a greater demand for cotton of medium and long staple.

79. *Translation of "A Guide to Indian Cottons" into Indian languages.*—Reference was made in the last Annual Report to the "Guide to Indian Cottons" published jointly by the East India Cotton Association and the Committee. Gujerati, Marathi and Kanarese editions of the Guide were issued during the year under report and Hindi and Urdu versions will be available shortly.

80. *Publications.*—The undermentioned statistical publications were issued during the year under report :—

1. *Statistical Leaflet No.* 1, Fifth Issue (1937–38), "Report on the staple length of the Indian cotton crop of 1937–38 season."
2. *Statistical Leaflet No.* 2, Fourth Issue (1936–37), "Stocks of Indian raw cotton held in India by the mills and the trade on 31st August 1937."
3. *Statistical Leaflet No.* 3, Fourth Issue (1936–37), "Receipts at mills in India of raw cotton classified by varieties—1936–37 season."
4. *Statistical Leaflet No.* 4, Fourth Issue (1936–37), "Export by sea of Indian raw cotton classified by varieties—1936–37 season."
5. *Statistical Leaflet No.* 5, Second Issue (1936–37), "Report on the accuracy of the all-India cotton forecasts of 1936–37 season."
6. "A Guide to Indian Cottons"—in Gujerati, Marathi and Kanarese.

CHAPTER V.

General.

81. In this Chapter, it is proposed to give a general account of the work done and the progress made during the year in connection with those activities of the Committee which have not been described in the preceding chapters.

Madras Cotton Control Act.

82. Under this Act, which came into force in 1932, the cultivation and mixing of the short staple *neglectum* cotton, locally known as *Pulichai*, in the long staple cotton growing tracts producing *Tinnevellies*, *Karungannis* and *Cambodias* is prohibited. In the southern districts of the Province where the Act has been applied, a few stray plants of this variety of cotton were found in the main crop and were removed after issue of the prescribed notices.

Bombay Cotton Control Act.

83. Owing to the threatened invasion of long staple cotton areas by a short staple high ginning *herbaceum* cotton, locally known as *Goghari*, the Bombay Government in 1935 passed the Cotton Control Act, which made the cultivation, mixing or possession of *Goghari* cotton a punishable offence in specified areas. As a result of the application of the Act, and the launching of a vigorous propaganda by the Bombay Agricultural Department, *Goghari* may now be said to have almost completely disappeared from the areas where it was extensively grown in the past. During the year under review, the Act is reported to have worked satisfactorily in the area lying south of the Narmada.

Central Provinces Cotton Control Act.

84. The Central Provinces Cotton Control Act which was passed into law towards the end of 1936 came into operation on the 1st March 1937. The Central Provinces Government have enacted this Act to eradicate a very inferior short staple, prolific cotton, commonly known as *Garrow Hill* introduced from outside the Province which threatens to stultify their efforts for cotton improvement. The Act has been applied for a period of five years to the districts of Nagpur, Wardha, Amraoti, Yeotmal, Buldana, Akola and Nimar and the Sausar Tahsil of Chhindwara District. The Rules framed under the Act were published on the 30th May 1938, and a copy of these will be found in *Appendix X*.

Baroda Cotton Control Act.

85. As stated in the last year's report, the Bombay Cotton Control Act of 1935 was, by a notification of the Baroda State, dated the 25th April 1936, applied to the Baroda State with certain modifications to meet the requirements of the State. The existence of the Act backed by the Baroda Agricultural Department's arrangements for the supply of large quantities of seed of 1027 A.L.F. has resulted in almost complete elimination of *Goghari*.

Bhopal Cotton Control Act.

86. The Bhopal Cotton Control Act which passed into law in April 1937, aims at promoting the cultivation of superior cottons and prohibiting the growing of inferior cottons in the State. A copy of the Act will be found in *Appendix XI*. The question of framing rules under the Act is engaging the attention of the Bhopal Durbar.

United Provinces Cotton Pest Control Act.

87. It was stated in the last report that the United Provinces Cotton Pest Control Bill had been passed into law but that it had not yet been put into force. The framing of rules under the Act is still under the consideration of the Provincial Government.

Cotton Transport Act.

88. The clean-up measures referred to above are to a considerable extent supplementary to the Cotton Transport Act passed in 1923 at the instance of the Indian Central Cotton Committee by which Local Governments are empowered to exclude from any specified area cotton, *kapas* or seed from outside unless required for a special purpose and covered by a licence. Under this Act protected areas have been established in the Bombay Presidency, in the Madras Presidency and the Central Provinces and Berar, and in the following Indian States: Hyderabad, Baroda, Indore, Sangli, Rajpipla, Chhota Udepur and Baria.

Bombay.—The seven protected areas notified in the Bombay Province remained unchanged during the year under report. The question of amending the Bombay Notification under the Cotton Transport Act to enable half-pressed bales from Vyara and some other stations in Baroda State territory to be imported into the corresponding Surat protected area in British territory without license is still under consideration of the Bombay Government. At present, owing to a legal difficulty arising from the fact that the respective corresponding protected areas have been notified under different Cotton Transport Acts, unrestricted transport of cotton between the protected areas concerned is not permissible. The question of prohibiting the unrestricted transport by road of Olpad cotton into the Surat and Ankleshwar areas is also engaging the attention of the Bombay Government.

Madras.—During the year under review, the Act worked smoothly in the Madras Presidency, but no change occured either in the number or in the demarcation of the areas protected under it.

Central Provinces.—There was no change in the protected areas in the Central Provinces and Berar.

Indian States.—The Baroda Government have issued a notification declaring the Mehsana District to be a protected area and prohibiting the import into it of outside cotton either by road or rail, except under license. During the year under report, four check stations were established at Ukai, Gayasar, Wankal and Don on the border between West Khandesh and Songadh.

No changes were effected in the protected areas in the Hyderabad, Sangli, Rajpipla, Chhota Udepur, Baria, Lunawada, Bhaderwa, Kadana, Sant, Sanjeli and Jambughoda States.

The protected area in the Indore State remained unaltered. The question of amplifying the Act wherever possible to which reference was made in the previous report is still engaging the attention of the Holkar Durbar.

COTTON GINNING AND PRESSING FACTORIES ACT.

89. The Cotton Ginning and Pressing Factories Act, 1925, applies to the whole of British India, and practically all cotton growing Indian States have passed parallel legislation. This Act requires every bale of cotton to be stamped with a mark showing where it was pressed; certain other matters dealing with the management of ginning and pressing factories were dealt with, and regular returns of cotton pressed each week were made compulsory. Modifications in the Rules have been called for from time to time, but the working of the Act has undoubtedly been a salutary check on occasional malpractices.

During the year under report a few cases of infringement of the Act were brought to the notice of the Provincial and State authorities concerned. In two cases in which press marks were indecipherable, the factory-owners were warned. In another case in which bales pressed in a factory in Sind were found to carry mutilated and indecipherable marks, double year marks and incorrect press marks, the omissions were reported to be due to the inexperience of the Manager and, as the factory-owners promised to be more careful in future, no further action was taken. Some bales pressed in a factory in the United Provinces bore incorrect year marks, and the matter was reported to the authorities concerned for necessary action. Four prosecutions were instituted in the Punjab for breaches of various sections of the Act and fines were imposed in two cases, two cases remaining undecided. In the same Province three cases have been instituted against factory-owners for infringement of the Act with regard to structural requirements.

A new State, *viz.*, Vaktapur Taluka (Western India States Agency) introduced legislation for the marking of bales and submission of weekly returns during the year. Out of the 70 Indian States in which legislation exists, weekly returns were received from 68.

The Commissioner of Labour, Bombay, forwarded for the consideration of the Committee the views of the Government Pleader, Ahmedabad, regarding the conclusiveness of evidence in connection with a case involving the irregular marking of bales. The view expressed by the Committee was that, as arbitrators of the East India Cotton Association who saw the bales in question could not be expected to go up-country to give evidence, a Commission should be taken out to Bombay to record the evidence of the seller, one of the arbitrators and the survey clerk.

Amendment of the Act.—During the year under report, the Committee considered a suggestion for the amendment of Section 14 of the Cotton Ginning and Pressing Factories Act in such a way that the right of a purchaser to reject a bale of cotton would be limited to bales not bearing the special mark prescribed for the factory under section 4 (*i*) of the Act, since under the present Bye-laws of the East India Cotton Association bales can be rejected and penalties claimed even for minor faults in marking, although there is no dispute about the quality of the cotton tendered. Other amendments of a minor nature proposed were that provision should be incorporated either in the Act or Rules to the effect that if bales are correctly marked, it should be presumed, as between buyer and seller, that they were so marked before leaving the factory, that the word "clearly" in Rule 7 of the Cotton Ginning and Pressing Factories Rules should be deleted and that it should be made clear that there would be no objection to the special mark and the serial number appearing both on the hessian and hoops. These amendments were approved by the Committee and have been accepted by the Government of India.

Reference was made in last year's report to the proposed amendment of Section 9 (*i*) of the Cotton Ginning and Pressing Factories Act, so as to bring within its scope also those factories which were constructed before its commencement. The matter has since been considered by the Government of India who expressed the view that a general provision of the nature suggested would be inequitable as it would mean in effect that no alteration even of a trivial character to a pre-Act factory could be undertaken without imposing on the owner the liability to reconstruct the whole factory. They considered that the most that could be done was to amend Section 9 of the Act in such a way as to render the factory-owner making alterations or additions to his factory liable to cause them to conform to the requirements which sub-section (*i*) of that section would have caused to attach to an original construction, in so far as these requirements are directly relevant to the alterations or additions and in so far as they are separable *vis a vis* the requirements from the structure as a whole. The views of the Government of India were accepted.

LICENSING OF GINNING AND PRESSING FACTORIES.

90. It was reported last year that the Governments of Bombay, the Central Provinces and Berar and Sind had passed legislation empowering them to prohibit the watering, mixing and admixture of cotton and making it obligatory on all cotton ginning and pressing factories situated in areas to which the Act is applied to obtain licenses for their working. The Government of the Central Provinces and Berar have since framed the necessary rules bringing the provisions of the Act into operation. The Bombay and Sind Governments have not yet passed the required rules.

As doubts had arisen whether, under the Cotton Ginning and Pressing Factories (Bombay Amendment) Act, mixing of cotton waste with cotton and the deliberate watering of cotton so as not to cause the water contents to exceed a prescribed limit, were offences, a Bill* was passed by the Bombay Legislative Assembly in August 1938 making these acts punishable with fine.

The Committee considered the draft of a Bill† which the Government of Madras proposed to introduce for the licensing of ginning and pressing factories. The bill closely follows the Bombay Act with a few additional clauses to suit local conditions. One of the clauses of the draft Bill contains provision to the effect that " no cotton which is ginned or pressed in a cotton ginning or cotton pressing factory shall contain any admixture of cotton without specifying the fact conspicuously on the outside of the bale or *borah* in the prescribed manner, and that every bale or *borah* of cotton not bearing the mark 'mixed' shall be considered as containing pure cotton. The local spinning mills, however, may mix in any way necessary to their industry, provided that the mixing takes place in the gins or presses installed in the mill premises and that when such bales or *borahs* are for sale, they are to be labelled clearly on the outside as 'mixed' ". As this provision is opposed to the Committee's policy regarding the mixing of cotton, it was resolved that a recommendation should be made to the Government of Madras for its deletion.

There has, without doubt, been a steady improvement in the purity of Indian cotton during the last 12 years due not only to the legislations referred to above, but to the firm action taken by the East India Cotton Association to penalise watered, mixed or false-packed cotton when tendered against their contracts.

MALPRACTICES.

91. Complaints received regarding watering of cotton at certain centres in the Punjab, the Baroda State and in the Central Provinces and Berar were reported and the attention of the authorities concerned was drawn to them.

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* Appendix XII. † Appendix XIII.

In the Punjab case, owing to the absence of legislation, it could only be pointed out to the factory-owners that such malpractices tended to lower the reputation of the cotton of the tract and adversely affected the trade. In the two cases of watering reported in the Baroda State, legal proceedings were instituted against the factory-owners concerned ; in one case the accused was acquitted by the Magistrate who tried the case on the ground that water had not been added to the cotton " in order to increase its weight " as defined in the Act, and that the presence of water was due to the carelessness of the workers in the factory. The Baroda Durbar has accordingly been requested to amend the Baroda State Cotton Ginning and Pressing Factories Act so that watering by any means whatsoever shall be penalised. In the second case, the complaint was dismissed by the Court on the ground that it was not proved on the strength of the evidence led and because the bales were not produced in Court. In order to overcome the difficulty connected with the production of the actual bales as evidence, the Baroda State authorities have been informed that in such cases a commission should be taken out to Bombay to record the evidence of the seller, one of the arbitrators and the survey clerk of the East India Cotton Association.

A cotton exporting firm in Bombay reported that the malpractice of watering was being resorted to in factories at Khandwa, Nimarkheri, Bir, Harsud and Khirkiya in the Central Provinces. It was also stated that the District Magistrate, who investigated the Khandwa case, merely warned the offenders without instituting legal proceedings against them. The matter was brought to the notice of the Government of the Central Provinces and Berar and it was pointed out to them that leniency in dealing with cases of this kind would adversely affect the enforcement of the Cotton Ginning and Pressing Factories (Central Provinces Amendment) Act. It is understood that necessary instructions have since been issued to the authorities for the detection of cases of this nature.

Two cases of stencilling on the uncovered ends or the incompletely covered portions of bales exported to Manchester were reported, and the exporters in question were asked to take steps to prevent such stencilling, as it was a source of trouble to the mills using the cotton and also led to waste and consequent loss to the mills concerned.

BETTER MARKETING.

92. The Committee has devoted much attention to the improvement of primary cotton marketing and with considerable success. Regulated cotton markets existed in Berar before the establishment of the Central Cotton Committee, and that system which had stood the test of time was commended with certain modifications for general adoption. The Bombay Presidency was the first to pass the Cotton Markets Act, and a number of regulated markets have been established. In the Central Provinces an Act bringing the markets in the Central Provinces proper into line with Berar was passed with some further improvements, the Bill being sponsored by a member of the Central Cotton Committee who was also a member of the local Legislature. The Berar Marketing Act and Rules were subsequently improved.

In Madras, the Marketing Act which includes cotton has been passed, though so far only one regulated market has been notified. In Hyderabad, Indore, and several other Indian States, similar laws have been passed and open markets established. The Indian Central Cotton Committee during the period 1924–26, carried out a number of local surveys of cotton marketing, and the fact was established beyond doubt that in those tracts where regulated markets existed, these markets were being used by cultivators themselves to the extent of some 50% of the arrivals, and that the prices obtained, even when cotton was sold in villages, were far better than in the immediately adjoining and similar tracts which were not linked up with regulated markets. This first-hand information justified the Committee in recommending all Provincial Governments to adopt the regulated market system.

During the year under report four new cotton markets were established under the Bombay Cotton Markets Act, *viz.*, at Broach, Bijapur, Jalgaon (East Khandesh) and Dondaicha (West Khandesh), thus bringing the total number of regulated markets in the Province to nine. The question of establishing regulated markets at Nargund (District Dharwar), Hubli and Gadag is under consideration.

As stated above, only one regulated cotton market has been established at Tirupur in the Coimbatore District of the Madras Province under the provisions of the Madras Commercial Crops Markets Act of 1933. The question of establishing additional markets has been deferred, as the Provincial Government desire to watch for some time longer the working of the Tirupur Cotton Market with which they are not quite satisfied at present. This matter was considered by the Indian Central Cotton Committee recently, and it was decided to suggest to the Provincial Government that if another experimental market were tried at a less complicated centre, better results might be achieved.

No new additions have been made to the seven regulated cotton markets in the Central Provinces reported last year. The Provincial Government, at the instance of the Committee, have, however, drawn the attention of the authorities concerned to the slow progress made in the establishment of regulated cotton markets, and they have been asked to furnish lists of suitable places where such cotton markets could be set up.

In the Punjab, a bill known as 'Punjab Agricultural Produce Markets Bill,' * has recently been introduced, providing for the better regulation of the purchase and sale of, and the establishment of markets for, agricultural produce including cotton. The Bill closely follows the Madras Commercial Crops Markets Act.

The framing of rules under the Baroda Agricultural Produce Market Act is still under consideration of the Baroda Durbar. The Act was once applied to the Amreli Taluka of the State, but was subsequently withdrawn.

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* Appendix XIV.

In Sangli State, A Huzur Order regulating the sale and purchase of the commercial crops in the State is in force.

During the year under review, the Hyderabad Agricultural Markets Act was in force at the following twelve markets : Aurungabad, Jalna, Parthur, Hingoli, Sailu, Nanded, Umri, Latur, Raichur, Warangal, Adilabad and Badepalli. The Act is applicable to all important agricultural produce, including cotton.

In connection with the adoption of a definite cotton policy in Gujerat, one of the views expressed was that, as the crux of the whole problem centred round the better marketing of 1027 A.L.F. cotton in the Surat District, the Agricultural Produce (Grading and Marking) Act should be utilised in order that 1027 A.L.F. might be marketed as a special variety of Surat cotton. As the object of this Act is to protect marks which are indicative of quality, it is considered that there should be no difficulty in laying down that any cotton marked with AGMARK shall be grown from the seed of that particular variety, and that any cotton produced in certain specified areas shall be eligible to be marked with the grade designation mark. The Government of India have been requested to take steps for the inclusion of cotton in the schedule under the Agricultural Produce (Grading and Marking) Act to enable specified varieties of cotton to be protected under it. This proposal had been supported by the majority of the commercial bodies consulted, and when finally accepted, will make a further advance in the improvement of cotton marketing.

The latest development in connection with the improvement in the marketing of cotton is the provision by the Committee, in co-operation with All-India Radio, of a limited number of rural broadcast receivers in suitable markets for the broadcasting of cotton prices. The Government of India have agreed to advance the time of the broadcast of cotton prices from 1 p.m. to 10-30 a.m. as an experimental measure for six months. The following eleven markets have been selected for the installation of receiving sets : Bhalwal, Pattoki, Pakpattan and Kaithal in the Punjab ; Khandwa, Burhanpur, Yeotmal and Warora in the Central Provinces and Berar ; Bailhongal and Athani in the Bombay Province and Bellary in the Madras Province. Further details connected with the working of the experiment, however, still remain to be settled.

UNIVERSAL STANDARDS FOR INDIAN COTTONS IN INDIA.

93. Prior to 1933, standards for Indian cotton were prepared both by the East India Cotton Association and the Karachi Cotton Association. The latter Association prepared standards for Bengals, Sind, Punjab-American and Sind-American cottons, whilst the former had standards for other varieties as well. As the standards prepared by these two Associations in respect of the same varieties of cotton differed, a certain amount of competition between the two markets resulted, and this was felt to be detrimental to the interests of the cotton trade. To remedy these defects, the Indian Central Cotton Committee decided to recommend to the cotton exchanges concerned the adoption of standards which would be of universal application in India. Accordingly, with the co-operation of the East India Cotton Association and the Karachi Cotton Association for the first time in 1934, standards common to the Bombay

and Karachi cotton markets were prepared by a Special Sub-Committee of the Indian Central Cotton Committee known as the Standards Sub-Committee, the constitution of which is given earlier in this report. During the year, universal standards for the following varieties of cotton were prepared :—

1. *Bengals*,
2. *Sind*,
3. *Punjab-American*,
4. *Sind-American*,
5. *Oomras*,
6. *Mathias*,
7. *Broach*,
8. *Dholleras*.

Universal standards for *Kumptas* were not prepared as the crop was late.

The Karachi Cotton Association have since adopted the Universal Standards of the Committee as the basis for their own standards. At a recent meeting, the Committee decided to recommend to the East India Cotton Association that trading in the Bombay market should be transacted on the basis of the Universal Standards of the Committee.

PERIODICAL REVIEWS OF THE STATE OF FOREIGN TRADE IN INDIAN COTTON.

94. In connection with the question of finding wider markets for Indian cotton, it was considered desirable that the Committee should keep in touch with developments in foreign countries relating to changes in tariff rates, trade restrictions and the demand for various types of Indian cotton. Through the courtesy of the Director-General of Commercial Intelligence and Statistics, a clerk is employed in his office at the Committee's expense with the object of furnishing monthly reviews of the state of foreign trade in Indian cotton. These reviews are supplied to trade associations and chambers of commerce represented on the Committee and, in order to widen the sphere of their usefulness, they have now been made available to the general public at a small charge.

MEANS TO PREVENT THE INTRODUCTION OF FOREIGN COTTON PESTS.

95. Mention should be made here of the measures taken by the Committee to prevent the introduction of the American Cotton Boll-weevil (*Anthonomus grandis*) into India with imported American cotton. On the recommendation of the Committee in 1925, the Government of India ordered that all American cotton should be fumigated prior to landing. Under the present regulations, American cotton can be imported into India only through the port of Bombay where fumigation is carried out under the Committee's technical supervision with hydrocyanic acid gas. The scheme is a self-supporting one, the cost being met by a small levy on each bale of American cotton imported. The imports of American cotton during the year under review amounted to 142,530 bales as against 16,923 bales in the preceding year.

The Red (Sudan) Boll-worm (Diparopsis castanea) and other pests.—The restriction on the import of foreign *kapas* (unginned cotton) and of foreign cotton seed remained in force throughout the year. Forty parcels of cotton seed were received during the year, examined and fumigated where necessary.

COLLECTION AND SUPPLY OF INFORMATION.

96. Notes* on the progress in the introduction of improved varieties of cotton in the Provinces and Indian States and on the work of the Committee were supplied as usual to the East India Cotton Association and the Karachi Cotton Association for publication. The weekly statements of purchases and arrivals of American cotton were published as usual for general information. The names of ginning and pressing factories in Indian States with the requisite details regarding press marks, name of the owner or occupier, etc., were obtained and communicated to the Director-General of Commercial Intelligence and Statistics, Calcutta, for publication in the *Indian Trade Journal* and for incorporation in the all-India list of cotton ginning and pressing factories published by that Department.

During the year under review, the various aspects connected with the publicity and propaganda activities of the Committee were examined, and it was decided that the existing Propaganda and Publicity Section should be retrenched and that the necessary publicity work should be carried out by the Secretary's office. It was further decided that, if any Provincial Department of Agriculture should want special help for propaganda to popularise any successful results achieved from research financed by the Indian Central Cotton Committee, a separate grant should be sanctioned for the purpose.

PRESENT POSITION OF COTTON.

97. The situation arising from the slump in world prices of cotton during the year received close attention, and several proposals were examined with the object of affording some measure of relief to the cultivator. A representation was made to the Government of India for a reduction in the freight rates of cotton, and the various Provincial Governments were requested to take steps to reduce ginning and pressing charges wherever these were high. The question of the effect of raising the import duty on foreign cotton was also examined. The general opinion of the Committee was that, if Indian cotton prices reached parity with American, the protective duty on imported cotton of staple lengths 1″ and under would definitely help the cotton grower. From enquiries made, however, it was ascertained that the bulk of the American cotton imported into India in 1937–38 was of staple length $1\frac{1}{8}$″ and above; the quantity, therefore, which could be said to compete with Indian cotton was negligible. The following table shows the staple length distribution of the imported American cotton during 1937–38 :—

IN ACTUAL BALES.

31/32″	1–1/32″	1–1/16″	1–3/32″	1–1/8″	1–5/8″	TOTAL.
600	500	3,078†	10,025	130,657‡	331§	145,191

* Appendix XV.
† Includes 428 bales Brazilian.
‡ Includes 30 bales Brazilian.
§ Peruvian.

The question of curtailing the area under cotton and the problem of finding alternative uses for short staple Indian cotton also received close attention. It was, however, felt that the remedy for the low prices of cotton did not lie in a general curtailment of the area under cotton, as such a policy was fraught with danger of India losing her export market for cotton. A recommendation was, however, made to the Provincial Governments to discourage the growing of cotton on marginal lands where the yields are poor, and cotton growing relatively unremunerative. Renewed efforts at raising the efficiency of cotton cultivation, and replacement of short staple cotton by medium or long staple cotton as far as possible were considered to be fruitful lines of action. The attention of the Provincial Governments and Indian States has been drawn to these points.

PUBLICATIONS.

98. Arrangements have been made whereby a number of important scientific and technical journals are received in the Secretary's office, partly by subscription and partly on an exchange basis. These are circulated to Committee's research workers who are thus kept in touch with the latest scientific literature, which would otherwise not have been accessible to them.

The Committee desires to express its indebtedness to those institutions on whose free mailing list its name has been placed. Particular mention may be made of the British Cotton Industry Research Association for its Summary of Current Literature and the Shirley Institute Memoirs, and the Empire Cotton Growing Corporation, the British Cotton Growing Association, and the East India Cotton Association for the supply of their publications. The Committee further records its thanks to the Indian Trade Commissioner, London, the U.S.A. Department of Agriculture, U.S.A. Agricultural Experiment Station, the Lingnan University, Canton, China, the Mitsubishi Economic Research Bureau, Tokio, Japan, the Egyptian Ministry of Agriculture, Technical and Scientific Science, the International Institute of Agriculture, Rome, the Liverpool Cotton Association, the Lancashire Indian Cotton Committee, the Imperial Bureau of Plant Genetics, Cambridge, the Manchester Cotton Association, the Textile Institute, Manchester, the Imperial Institute, London, the Indian Statistical Institute, the National Institute of Sciences, Calcutta, the Academy of Sciences and other Associations and Chambers of Commerce for supplying it with reports, statistics, and other valuable literature from time to time. The Committee is also on the free exchange list of the Imperial Council of Agricultural Research, the Imperial Agricultural Research Institute, New Delhi, and the Director General of Commercial Intelligence and Statistics, Calcutta.

SECRETARY'S TOURS.

99. During the year under report, the following places were visited by the Secretary in connection with the research, seed distribution and other schemes :—

Delhi, Indore, Baroda and Nagpur.

FINANCIAL.

100. In *Appendix XVI* will be found a statement showing the Receipts and Expenditure of the Committee and also the Balance Sheet for the year ended March 31st, 1938. Receipts amounted to Rs. 8,01,765-15-9 (gross) and expenditure totalled Rs. 10,44,261-1-2.

D. N. MAHTA,

Secretary.

APPENDIX I.

MEMBERS OF THE COMMITTEE.

(1) PRESIDENT—

Sir Bryce Burt, C.I.E., M.B.E., I.A.S., Offg. Vice-Chairman, Imperial Council of Agricultural Research, *ex-officio*.

(a) The Expert Adviser to the Imperial Council of Agricultural Research in Agricultural matters, *ex-officio*.

(2) REPRESENTATIVES OF AGRICULTURAL DEPARTMENTS :—

Madras	Mr. P. H. Rama Reddi, I.A.S., Director of Agriculture.
Bombay	The Director of Agriculture.
United Provinces	The Director of Agriculture.
Punjab	The Director of Agriculture.
Central Provinces and Berar	Mr. J. C. McDougall, I.A.S., Director of Agriculture.
Sind	Rao Saheb K. I. Thadani, Director of Agriculture.

(3) THE DIRECTOR-GENERAL OF COMMERCIAL INTELLIGENCE AND STATISTICS, *ex-officio*.

(4) REPRESENTATIVES OF CHAMBERS OF COMMERCE AND ASSOCIATIONS :—

The East India Cotton Association ..	Sir Purshotamdas Thakurdas, C.I.E., M.B.E.
The Bombay Millowners' Association ..	Mr. S. D. Saklatvala, M.L.A.
The Bombay Chamber of Commerce ..	Mr. M. S. Durutti.
The Indian Merchants' Chamber ..	Mr. Chandulal P. Parikh, M.L.A.
The Karachi Chamber of Commerce ..	Mr. A. P. Darlow.
The Ahmedabad Millowners' Association	Mr. Kasturbhai Lalbhai.
The Tuticorin Chamber of Commerce ..	Mr. J. Venesch.
The Upper India Chamber of Commerce.	Mr. J. Tinker.
The Empire Cotton Growing Corporation.	Sir William Roberts, C.I.E.

(5) COMMERCIAL REPRESENTATIVES NOMINATED BY CENTRAL GOVERNMENT :—

Central Provinces and Berar	Mr. P. V. Deshmukh. Mr. D. K. Kane.
Madras	Mr. J. Nuttall.
Punjab	Mr. Balak Ram.
Bengal representative	Mr. Girija Prosanna Chakraverty.

(7) CO-OPERATIVE BANKING REPRESENTATIVE :—

Sir Chunilal V. Mehta, K.C.S.I. (Vice-President).

(8) REPRESENTATIVES OF COTTON-GROWING INDUSTRY :—

Madras	M.R.Ry. V. C. Palaniswami Gounder, Avl. M.R.Ry. H. Sitarama Reddi Garu, M.L.A.

Bombay	Mr. Yashwantram Rajaram Joshi.
United Provinces	Vacant.* Vacant.*
Punjab	Sardar Saheb Gurbachan Singh, M.L.A. Ch. Mohammad Yasin Khan, M.L.A.
Central Provinces and Berar	Rao Bahadur Sir Madhaorao Deshpande, K.B.E. Mr. M. P. Kolhe.
Sind	Mr. Roger Thomas.

(9) AND (10) REPRESENTATIVES OF INDIAN STATES :—

Hyderabad State	Mr. Nizam-ud Din Hyder, Director of Agriculture.
Baroda State	Mr. R. G. Allan, C.I.E., Commissioner of Agriculture.
Gwalior State	Sardar D. K. Jadhav, Director of Agriculture.
Rajputana and Central India States ..	Mr. T. R. Low, I.A.S.

(11) ADDITIONAL MEMBERS NOMINATED BY THE GOVERNOR-GENERAL-IN-COUNCIL :—

1. Rao Bahadur S. S. Salimath, Deputy Director of Agriculture, Southern Division, Dharwar.
2. Dr. V. K. Badami, Ph.D., Deputy Director, Department of Agriculture in Mysore State, Bangalore.
3. M.R.Ry. V. Ramanatha Ayyar Avl., Cotton Specialist, Coimbatore.
4. Rai Bahadur S. V. Kanungo, Finance Minister, Holkar State, Representative of the Holkar State.
5. Seth Isserdas Varindmal, M.L.A., Representative of the Karachi Indian Merchants' Association.
6. The Economic Botanist (Cotton) to the Government of the United Provinces, Cawnpore.
7. Sardar Rao Bahadur Bhimbhai R. Naik, Sagrampura, Surat.
8. Lala Shri Ram, Representative of the Cotton Millowners of Delhi.
9. Mr. Chellaram Shewaram, Representative of the Karachi Cotton Association, Ltd.
10. Dewan Bahadur Sir. T. Vijayaraghavacharya, K.B.E.
11. Mr. Mangesh Babhuta Patel, M.L.A., Shahada, District West Khandesh.
12. Mr. H. B. Rajdev, Deputy Director of Agriculture, Karnatak Division, Raichur.
13. Dr. T. E. Gregory, D.Sc., Economic Adviser to the Government of India.
14. Vacant.†

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* Ch. Shiva Mangal Singh, M.L.A., and Rai Bahadur Lakshmi Raj Singh since appointed.

† Mr. Jamshed Nusserwanji, M.L.A., since appointed in place of the Hon'ble Syed Miran Mohammad Shah, resigned.

APPENDIX II.

CONSTITUTION OF SUB-COMMITTEES.

Agricultural Research Sub-Committee.

I. *The President*—Sir Bryce Burt (ex-officio).

II. *The Vice-President* .. .. .. } Sir Chunilal V. Mehta (ex-officio).
III. *The Co-operative Banking Representative* }

IV. *The Cotton Growers' Representatives.*—Sir William Roberts; Rao Bahadur Sir Madhaorao Deshpande; Mr. Roger Thomas; Sardar Saheb Gurbachan Singh.

V. *Cotton Trade Representatives.*—Sir Purshotamdas Thakurdas; Mr. Kasturbhai Lalbhai; Mr. Chandulal P. Parikh; Mr. D. K. Kane.

VI. *Agricultural Officers.*—The Agricultural Expert to the Imperial Council of Agricultural Research (ex-officio); Mr. H. R. Stewart; Mr. W. J. Jenkins; Mr. P. B. Richards; Mr. P. H. Rama Reddi; Mr. J. C. McDougall; Mr. R. G. Allan; The Director, Institute of Plant Industry, Indore (ex-officio); Rao Saheb K. I. Thadani; Mr. Nizam-ud Din Hyder; Mr. V. Ramanatha Ayyar; Dr. V. K. Badami.

VII. *Additional Members.*—Dewan Bahadur Sir T. Vijayaraghavacharya; Mr. Chellaram Shewaram; Mr. Mohammad Afzal; Mr. K. Ramiah; Rai Saheb Kalidas Sawhney; Dr. B. L. Sethi.

VIII. The Secretary.

Standing Finance Sub-Committee.

The Vice-President (Sir Chunilal V. Mehta) (Chairman),
The President (Sir Bryce Burt) (ex-officio),
Sir Purshotamdas Thakurdas,
Mr. S. D. Saklatvala,
Mr. J. Vonesch,
Mr. Kasturbhai Lalbhai,
Rao Bahadur Sir Madhaorao Deshpande,
Mr. M. S. Durutti,
Mr. Chandulal P. Parikh (in place of Mr. W. J. Jenkins on leave).

Local Sub-Committee.

The President (Sir Bryce Burt),
The Vice-President (Sir Chunilal V. Mehta),
Sir Purshotamdas Thakurdas,
Mr. S. D. Saklatvala,
Mr. Kasturbhai Lalbhai,
Rao Bahadur Sir Madhaorao Deshpande,
Sardar Rao Bahadur Bhimbhai Ranchodji Naik,
Mr. J. Vonesch,
Mr. M. S. Durutti,
Mr. Chandulal P. Parikh,
Mr. W. J. Jenkins,
Mr. A. P. Darlow.

COTTON GINNING AND PRESSING FACTORIES SUB-COMMITTEE.

The Vice-President .. .. ..
The Co-operative Banking Representative. } Sir Chunilal V. Mehta (ex-officio),
Sir Purshotamdas Thakurdas,
Mr. S. D. Saklatvala,
Mr. Kasturbhai Lalbhai,
Mr. M. S. Durutti,
Mr. J. Vonesch,
Sir William Roberts,
Mr. W. J. Jenkins,
Mr. J. Tinker,
Mr. P. V. Deshmukh,
Mr. J. Nuttall,
Mr. Chellaram Shewaram,
Mr. Balak Ram.

TECHNOLOGICAL RESEARCH SUB-COMMITTEE.

The President—Sir Bryce Burt .. ..
The Vice-President—Sir Chunilal V. Mehta .. .. .. } (ex-officio).
The Agricultural Expert to the Imperial Council of Agricultural Research .. ..
Sir Purshotamdas Thakurdas,
Dewan Bahadur Sir T. Vijayaraghavacharya,
Mr. S. D. Saklatvala,
Mr. Kasturbhai Lalbhai,
Lala Shri Ram,
Mr. H. R. Stewart,
Mr. W. J. Jenkins,
Mr. P. H. Rama Reddi,
Mr. Chandulal P. Parikh,
Mr. M. S. Durutti,
Mr. J. Tinker,
Mr. J. Vonesch,
Mr. P. V. Deshmukh,
Mr. E. F. G. Gilmore,
Dr. Nazir Ahmad,
Mr. F. Stones, Mr. A. D. Walwyn (Representing Bombay Millowners' Association),
Seth Nanddas Haridas, Seth Shantilal Mangaldas (Representing Ahmedabad Millowners' Association),
Mr. R. G. Saraiya, Mr. Jamnadas Ramdas (Representatives of the East India Cotton Association, Ltd.),
Mr. T. B. Dalal (Representing the Karachi Cotton Association, Ltd.).

RESEARCH STUDENTS SELECTION SUB-COMMITTEE.

The President—Sir Bryce Burt,
The Vice-President—Sir Chunilal V. Mehta,
Sir Purshotamdas Thakurdas,
Dewan Bahadur Sir T. Vijayaraghavacharya,
Mr. Kasturbhai Lalbhai,
Dr. W. Burns,
Mr. P. B. Richards,
Mr. H. R. Stewart,
Mr. W. J. Jenkins,
Mr. P. H. Rama Reddi,
Mr. J. C. McDougall,
Rao Saheb K. I. Thadani,
Mr. R. G. Allan,
Mr. T. R. Low,
Mr. Nizam-ud Din Hyder,
Dr. V. K. Badami,
Dr. Nazir Ahmad,
Mr. K. Ramiah,
Seth Issardas Varindmal,
Vacant (one seat).

COTTON FORECAST IMPROVEMENT SUB-COMMITTEE.

The President (ex-officio),
The Agricultural Expert, Imperial Council of Agricultural Research (ex-officio),
The Director-General of Commercial Intelligence and Statistics,
The Director of Agriculture, Bombay Presidency,
,, ,, Punjab,
,, ,, Madras,
,, ,, United Provinces,
,, ,, Central Provinces and Berar,
,, ,, Sind,
,, ,, H. E. H. the Nizam's Government,
The Commissioner of Agriculture, Baroda,
The Director of Statistics, H. E. H. the Nizam's Government,
The Director of Land Records, Central Provinces and Berar,
The Deputy Director of Statistics, Department of Commercial Intelligence and Statistics,
The Statistical Officer, Department of Industries, Madras,
Mr. J. Vonesch,

WIDER MARKETS SUB-COMMITTEE

The President—Sir Bryce Burt,
The Vice-President—Sir Chunilal V. Mehta,
Sir Purshotamdas Thakurdas,
Dewan Bahadur Sir T. Vijayaraghavacharya,
Dr. John Matthai,
Mr. S. D. Saklatvala,
Mr. Kasturbhai Lalbhai,
Dr. W. Burns,
Dr. T. E. Gregory,
Mr. H. R. Stewart,
Mr. P. B. Richards,
Mr. W. J. Jenkins,
Sir William Roberts,
Mr. P. H. Rama Reddi,
Mr. J. C. McDougall,
Sardar Rao Bahadur Bhimbhai Ranchodji Naik,
Mr. Chandulal P. Parikh,
Mr. J. Vonesch,
Mr. M. S. Duratti,
Seth Isserdas Varindmal,
Rao Saheb K. I. Thadani,
Mr. Nizam-ud Din Hyder,
Mr. P. V. Deshmukh,
Mr. Balak Ram,
Dr. Nazir Ahmad,
Mr. R. G. Sariya—Additional Member,
Vacant (one seat).

STANDARDS SUB-COMMITTEE.

Lala Shankar Lall (Representing the Imperial Council of Agricultural Research),

Mr. Haridas Madhavdas, Mr. Varjivandas Motilal (Representing East India Cotton Association, Ltd.),

Mr. D. McCallum, Mr. Chellaram Shewaram (Representing the Karachi Cotton Association, Ltd.),

Rao Bahadur Sir Madhaorao Deshpande, Mr. M. P. Kolhe (Representatives of Cotton Growers of Berar Tract),

Mr. Haribhai Jhaverbhai Amin, Mr. Ardeshir Jamshedji Kapadia (Representatives of Cotton Growers, Broach Tract),

Mr. Mulchand Vardhman Shah, Mr. Akhubava Takhatsinghji Chudasama (Representatives of Cotton Growers of Dhelleras Tract).

Mr. Himatlal Jagjivandas Vadodaria, Mr. Vadilal Chunilal Doshi (Representatives of Cotton Growers of Mathia tract).

Rao Bahadur S. J. Deshmukh, Rao Bahadur B. L. Patil (Representatives of Cotton Growers of Kumpta tract).

APPENDIX III.

LIST OF RESOLUTIONS.

"That a Sub-Committee consisting of two Directors of Agriculture, two representatives of growers, and two members of the Standing Finance Sub-Committee with the Vice-President as Chairman, be appointed to report on what propaganda activities the Indian Central Cotton Committee should undertake for the next three years and what staff is necessary."

"That the Indian Central Cotton Committee confirms the recommendation of the Local Sub-Committee and is further of the opinion that a proviso should be added to Section 14 of the Cotton Ginning and Pressing Factories Act to the effect that where 50 or more bales are to be tendered in fulfilment of a future contract made under the bye-laws of any recognised cotton association, the lot should not be rejected if a prescribed percentage of bales is marked."

"That the thanks of the Indian Central Cotton Committee be conveyed to the Empire Cotton Growing Coporation for their readiness and generosity in giving the services of Dr. T. G. Mason, F.R.S., to examine and report on the Physiological Research work financed by the Committee in the Punjab."

"The Indian Central Cotton Committee trusts that the Governments of Bombay and Baroda will take steps to ensure the cultivation of pure 1027 A.L.F. seed in the Surat district. The proposal contained in the Supplementary Note to restrict the 1A seed to certain zones is approved, and the Committee hopes that the result of such experimental restriction will be carefully watched by the Governments. The Committee repeats the view they have consistently expressed that it is essential in the interests of the reputation of Surat cotton and to the ultimate benefit of the cotton growers in Surat that 1027 A.L.F. should continue to be sown in larger quantity and to be marketed pure."

"That the Government of India be requested to grant a rebate of five annas per square bale and three annas per round or sample bale of American cotton fumigated during the year 1937-38."

"That, in future, no scheme for distribution of seed shall be sanctioned unless sufficient evidence is forthcoming that the strain proposed to be distributed is the one most suitable for that area."

"That it be recommended to the Madras Government that in the Cotton Ginning and Pressing Factories (Madras Amending) Bill Clause 4-3A. (1) the proviso beginning with 'without specifying the fact conspicuously . . . . . mixed' at the end be omitted."

"That where there is no difference of opinion between the Agricultural Research Sub-Committee and the Standing Finance Sub-Committee schemes should be submitted to the Government of India for sanction as required under the Act."

"That the new procedure be agreed to, subject to the clear understanding that any approval given to a scheme by the full Committee before its examination by the Standing Finance Sub-Committee is merely administrative approval to enable the Secretary to submit the scheme to the Government of India for sanction after it has been duly approved by the Standing Finance Sub-Committee. In the event of the latter not agreeing with the recommendations of the Agricultural Research Sub-Committee, the scheme in question must be referred to a joint meeting of the Agricultural Research Sub-Committee and the Standing Finance Sub-Committee at the next meeting. This procedure is experimental for two years."

APPENDIX IV.

Summary of Annual Report of the Director, Institute of Plant Industry, Indore, and programme of work for 1938-39.

The Institute of Plant Industry is a society registered under the Holkar State Societies Registration Act and its primary objects are :—

(*a*) The investigation into all matters relating to the production and improvement of raw cotton in India.

(*b*) The agricultural development of the Indian States and Territories who are members of the Society.

(*c*) The training of research students nominated by the Indian Central Cotton Committee.

(*d*) The training in practical agriculture of agricultural and revenue officers and subordinates deputed by the Member-territories.

Finance.

Funds for its upkeep are derived entirely from contributions. During the financial year 1937-38 the Indian Central Cotton Committee contributed Rs. 1,11,000, and the member States in Central India and Rajputana subscribed Rs. 41,850 as against Rs. 51,000 in 1936-37. Fluctuation in contributions from year to year makes budgetting uncertain and leads to considerable difficulty in deciding upon the next programme of research work. The financial year 1937-38 which opened with a balance of Rs. 1,000 closed with a balance of Rs. 5,374.

Board of Governors.

The Governing Body of the Institute consists of representatives appointed by the Indian Central Cotton Committee and the member-States in numbers proportionate to the contributions received from each body. Its President is the Resident for Central India, *ex-officio*, and Secretary, the Director of the Institute.

The 18th Meeting of the Board of Governors was held on 27th November 1937 at which the budget estimates and the programme of work for the year 1938-39 were considered and approved.

The recommendations of the Special Committee which sat in February 1937 to consider the Programme and staffing of the Chemistry and Agronomy Section were given effect to as from the beginning of the current financial year with such slight modifications as were approved of by the Board of Governors.

Staff.

The Director, Mr. T. R. Low, went on 7 months' leave from March 25th and Mr. K. Ramiah, the Geneticist and Botanist, was appointed to officiate as Director in addition to his own duties.

Member States.

During the year the State of Banswara in Rajputana and Beri Jagir in Central India became members. Ajmer-Merwara which had continued as a temporary member for some years resigned their membership as from 1st April 1938. At the closing date of this report the following States and Thikanas in Central India and Rajputana, arranged in order of joining, were Members of the Institute :—

Indore.	Bijawar.	Jodhpur.
Dhar.	Barwani.	Alwar.
Jaora.	Bikaner.	Khetri.
Datia.	Rewa.	Jhabua.
Rutlam.	Bundi.	Chhatarpur.
Dewas I.	Partabgarh.	Sikar.
Sitamau.	Orchha.	Dewas II.
Narsingarh.		Banswara.
Tonk.		Beri.

Karauli State, which had joined only for two years in December 1935 has now ceased membership.

Library.

Exchange of publications was kept up with the Agricultural Departments in India and important experiment stations abroad.

Technical publications of the Institute and those of the Indian Central Cotton Committee numbering 5573 copies, were distributed to the States of Central India and Rajputana and to the foreign institutions on the mailing list of the Institute. All scientific literature received during the year has been catalogued and filed after the Universal Decimal System of Classification.

Owing to a severe cut in the budget of the Library, certain journals and periodicals had to be discontinued. From the sale section of the Library, 1437 books and bulletins were sold to the value of Rs. 299-1-0.

Publications.

The following papers by members of the Institute Staff were published during the year :—

(1) Studies in Plant Breeding Technique II—The Design of Field Tests of Plant Breeding Material. J. B. Hutchinson and V. G. Panse. Ind. Journ. Agri. Sci. (1937) **7**, 531.

(2) A Note on Two New Genes affecting Anthocyanin Pigmentation in Asiatic Cottons. J. B. Hutchinson and R. L. M. Ghose. Ind. Journ. Agri. Sci. (1937) **7**, 873.

(3) The Genetics of Lintlessness in Asiatic Cottons. J. B. Hutchinson and P. D. Gadkari. Jour. Genet. (1937) **35**, 161.

(4) Cotton Botany and the Spinning Value and Hair Properties of Cotton Lint. J. B. Hutchinson and G. K. Govande. Ind. Jour. Agri. Sci. (1938) **8**, 21.

(5) Studies in Plant Breeding Technique III—Crop Analysis and Varietal Improvement in Malvi Jowar. J. B. Hutchinson, V. G. Panse, N. S. Apte & B. M. Pugh. Ind. Jour. Agri. Sci. (1938) **8**, 131.

(6) A Note on Petalody in Cotton. J. B. Hutchinson and R. L. M. Ghose. Curr. Sci. (1937) **6**, 99.

(7) A Review of Plant Breeding in India with suggestions for the future. K. Ramiah. Note for the Board Agri. Meet. (1937).

Papers read before the (25th) Silver Jubilee Meeting of the Indian Science Congress 1938 and abstracts published in the Proceedings of the Science Congress :

(1) Some Aspects of Plant Breeding in India. V. G. Panse.

(2) Preliminary Studies on Sampling in Field Experiments. V. G. Panse.

Two of the papers " The Distribution of Gossypium and the Evolution of the Commercial Cottons " and " The Classification of the Cottons of Asia and Africa" mentioned in the last year's report were printed together as an Institute Bulletin, No. 8.

The Imperial Council of Agricultural Research had appointed two Committees one for Cotton and the other for Rice to collect together all information on the range of variability in the two crops with J. B. Hutchinson and K. Ramiah as the respective convenors. The preliminary note for cotton had been drawn up by Mr. J. B. Hutchinson before he left India, and the two reports in the final form were prepared by Mr. K. Ramiah and sent to the Imperial Council of Agricultural Research for publication in their Journal.

PROPAGANDA AND EXTENSION WORK.

This consists of introducing into the general agricultural routine of the cultivators such of the results which research and experiment have shown to be profitable. The importance of this work is now well recognised and every endeavour is made to maintain as close a touch as possible with the State Departments of Agriculture and to help and encourage all forms of development work carried out by them. The duties of the Extension

Officer, who is maintained at the Institute for this purpose, are chiefly devoted to the propaganda and extension work in the States in addition to carrying out trials of improved varieties of crops in their areas. He in addition to his general work also attends large agricultural shows and *melas* with agricultural exhibits, posters and leaflets for display and demonstration. He also uses the cinematograph to show agricultural and other films of interest, such films being borrowed from the Indian Central Cotton Committee and Railway Publicity Board beside what the Institute possesses. During the year under report the extension Officer made 19 visits to the different States, 14 of which were concerned with *melas*. During these visits, in addition to the display of exhibits, he demonstrated the use of improved implements and he either actually sold or booked orders for such implements. He also arranged for the supply of improved seeds through the local agricultural staff.

Though the programme of visits to the States by the Extension Officer is arranged well in advance, the season for the *melas* in different places being the same, the number of *melas* he can possibly attend is limited. This difficulty is, however, overcome by the periodical visits of the Director to the States and by reciprocal visits of the officers of the States to the Institute for the purpose of keeping abreast of the latest developments. It is pleasing to note that several of the contributing States are taking a real interest and making efforts to raise the level of agriculture by the accepted methods of improvement.

A large number of demonstrations were given with regard to preparing composts from farm wastes and sanitary refuses and charring bones to augment the manure supply to the soils. The compost making has now become a regular routine in several States. Improved methods of growing the sugarcane crop, improved methods of manufacturing *gur* with the Sindewahi furnace, line sowing of cotton and other *Kharif* crops, drying of the cotton seed in the hot weather to check the pink-boll-worm incidence, treatment of *Jowar* seed with copper-sulphate against smut, use of insecticides against insects, importance of growing leguminous crops before *Rabi* crops in rotation and use of green manure crops in areas of good rainfall are some of the other items of propaganda carried out by the Extension Officer.

The importance of improving the condition of the cultivators' cattle both from the point of view of work and milk production side by side with improving arable agriculture has also been prominently kept in view. Several of the contributing States either maintain breeding herds for the production of high class bulls or are purchasing such bulls for distribution. There is a special breeding farm for Malwa bulls run in Holkar State and Jaipur State is also maintaining a breeding herd. The Dewan of the Dhar State is, as usual, taking a keen and personal interest in the breeding of Sindhi cattle. A comprehensive scheme of livestock improvement has also been started in Jodhpur State. Side by side with breeding and improvement work, the necessity for castrating worthless scrub bulls is being recognised and the use of the Burdizzo castrator is increasingly coming into vogue in several States.

Attention is also being paid to improving the quality of the feed to the cattle by demonstrating with grass cut at the right stage, silage making and growing of more profitable fodder crops like lucerne, mangold, etc.

Variety Trials.

Conducting of yield trials with different established varieties of crops in the States is an important activity of the Institute because the introduction of better variety of crops is the most tangible and easily appreciated item of work by the cultivators. But owing to varying local conditions the adaptability of particular varieties is found to be rather limited and properly conducted trials at a number of centres is the only criterion to determine the most suitable variety of each crop for the particular conditions. The material included under such trials consists of either strains evolved at the Indore Institute or those evolved by the departments of agriculture in provinces adjacent to the States. Where actual facilities to conduct proper trials do not exist or where one would like to reduce the number of varieties to be included in the trial, observations on single plots are first collected as a preliminary to undertaking regular trials with replications. During the year, 110 trials with different varieties of crops, *kharif* and *rabi*, were conducted besides as many single plot observations.

MALWA.

Cotton.—Two of the sub-strains of Malvi 9 (13 & 20) along with the best four of the Dhar Mass Malvi selections were compared against Malvi 9 at three centres. There were no significant differences in yield among the strains at any of the centres. They were all surprisingly uniform, even with regard to lint length and ginning percentage. It is possible that one of the Dhar strains might prove slightly better than Malvi 9 in lint length and ginning. While the trial will be repeated it has to be noted that seasonal factor has a big influence on fibre properties which is responsible for the superiority of M9-20 over M9 established before not being apparent during the year.

RAJPUTANA.

As in last year, P.A. 289F, Mollisoni, Cwn. 520 and local were compared in Bikaner State both on the Sri Ganganagar farm and outside in heavy and light soils. While some of the outside trials failed partly due to bad germination and partly to damage by dust storms, on all the trials successfully completed, P. 289F has given the highest yield though the differences were not statistically significant. With regard to stand, which is very important in the tract, there were significant differences and Mollisoni was better than both Cwn. 520 and P. A. 289F.

In Jaipur State, the comparison of Cwn. 520 and Cwn. 402 has, out of several trials in different centres, once again proved the superiority of Cwn. 520 in all respects. An experiment with thinning the crop has definitely shown that the operation is unnecessary and uneconomical.

In Jodhpur State, Indore 1 and Dhar Cambodia were compared against local and two Sind strains, Sind Sudhar and Perso-American, at a number of centres. The Sind varieties proved definitely unsuitable, as in addition to bad germination, they suffered from 'Red leaf.' Indore 1 was decidedly the best of the varieties.

Very similar results have been obtained from the Ajmer Merwara tract also. Here in addition to the American types, Cwn. 520 had also been included in the trial and though it yielded just as much as Indore 1 cannot be so profitable as Indore 1 which is a cotton of a better quality.

The variety trials conducted so far have proved definitely the suitability of Malvi 9 all over Malwa, Cwn. 520 for Jaipur, Indore 1 for Jodhpur and Ajmer-Merwara and P. 289F., Cwn. 520 and Mollisoni for the canal tract of Bikaner State.

OTHER CROPS.

There were several other trials conducted in the areas of member-States with different varieties of ground-nut, *bajra*, jowar, maize, paddy, etc., among *Kharif* crops and wheat, gram and linseed under *rabi* crops. As examples of successful results obtained in this line of work may be mentioned the following. Among groundnuts, Gangapuri, (a variety in Jaipur very probably the spreading Mauritius type) has proved the best for Rajputana conditions, Akola 12-24 for Malwa and Akola 10 for Bundelkhand. Similarly the *bajra* variety 'Jamnagar Giant' has proved the most suitable for greater part of Rajputana States.

WEATHER.

FARM :—

The total rainfall for the year was 38.44 inches which is upto the average. The distribution of this rain was however, erratic and was not quite as beneficial to the crops as should have been. The rains began on 21st June and over 8" were recorded before the close of the month. Such heavy rains closely following the sowings affected the germination of cotton to a certain extent. July was a very wet month with very nearly 15" of rain and this gave a set-back to the young cotton plants and no weeding or intercultivation was possible. August recorded only 4.8 inches of which 3 inches fell on one day and there were 9.46 inches in September, all of it in the first fortnight. The complete absence of rains subsequently ($\frac{3}{4}$" on one day in October) affected both the cotton crop and the *rabi*

wheats which suffered both in yield and in the quality of the wheat. Thus bad distribution of the rain was mainly responsible for the general complaint about the poor quality of the Malvi cotton of this season. Although the minimum temperature after the middle of December dropped to below 50° on several days until the middle of February, there was no frost and hence no damage to crop on that account. This was responsible for the picking season in cotton dragging on for a much longer time than usual. The absolute absence of rains after the middle of September resulted in hastening the ripening of *rabi* crops which were all off the field before the end of February.

Crops and yields.

During the year 68 acres were under various experiments of the Geneticist and Botanist and the Chemist and Agronomist. An additional 8 acres were under minor crops like paddy, barley, lucerne and soyabean.

The remaining 143.45 acres were cropped as under :—

Crop.	*Area in acres.*	*Average yield in mds. per acre.*	
Cotton	42.86	3.0	These are mainly bulk crops of standard varieties for seed multiplication and ultimate distribution to the contributing States.
Jowar	2.00	13.5	
Tuer	9.77	10.0	
Groundnut ..	5.50	9.0	
Wheat	48.85	7.4	
Linseed	21.62	3.2	
Gram	9.05	5.3	
Soyabean	3.80	3.8	

Several agronomic experiments with regard to response of cotton to manuring (organic and inorganic) in rich and poor lands, and with the manures applied on the surface or in different depths were under progress and these are dealt with in the detailed report of the Chemist and Agronomist. Experiments were also in progress with regard to determining the best way of growing the highly nutritious fodder, lucerne. Experiments on sugar-cane were towards determining the comparative merits of the different Coimbatore varieties, the optimum time of planting and the effect of organic and inorganic manures in varying doses and applied at different depths. The growing of cigarette tobacco was successful and the leaf cured by the special method of grass curing was considered fair in quality and was easily disposed of.

About 6,000 maunds of compost from farm wastes and 400 maunds from habitation wastes were manufactured during the year. Two pairs of bullocks were purchased during the year to replace old animals.

Provision for training.—Five students, 2 from Alwar, 1 from Tonk and 2 from Jhabua were given training in the farm during the year. Besides the above, 70 persons from member States and elsewhere visited for short periods to get training. One of the fieldmen was deputed to Jaipur, Kekri and Ajmer for demonstrating *gur*-boiling by McGlashan (Sindewahi) furnace and ploughmen were sent to Dewas and Holkar State Parganas to give demonstrations in the use of improved implements and *gur* making.

Implements and Seeds.

Various implements as *Kans* eradicting ploughs, ordinary ploughs, *bakhars*, Indore ridgers, *gur* making pans, etc., were sold to the contributing States to a total value of Rs. 1,500. 188 maunds of cotton seed and 100 maunds of other grains, wheats, *tuer*, groundnut, *jowar*, etc., from the farm produce were sold for seed purposes besides 423 maunds of sugarcane setts.

Cotton Seed distribution.

492 maunds of improved cotton seed (192 maunds of Malvi 1 and 300 maunds of Malvi 9 and its sub-strains) were collected during the year from 1936-37 crop in the Institute farm and the seed farms in the neighbouring villages to the Institute. After reserving about 10 maunds of Malvi 9 for farm sowings and about 56 maunds of the same cotton for

the contributing States, the balance of Malvi 9 and Malvi 1 was sold to the cultivators in villages adjacent to the Institute. This area of 1400 acres, 400 acres under Malvi 1 and 1000 acres under Malvi 9 was directly under the supervision of the Institute Staff. Periodical visits were made to rogue the crop and to make observations on wilt incidence. The seed cotton of all the 1400 acres except from those fields where there was wilt was bought by the Institute and the Malvi 1 *Kapas* was sent direct to one of the local mills. The Malvi 9 *Kapas* was ginned at the Institute and the lint was sold to local mills at a premium of Rs. 2-0-0 per *mani* of 6 maunds over the local cotton. About 480 maunds of Malvi 9 seed is kept for distribution during 1938-39.

Research Work.

While the full details of the research work carried out at the Institute are to be found in the detailed report submitted separately, only some of the important features are dealt with in this report.

Genetic variability.

An experiment to compare the genetic variability in F_2 and F_3 generations of crosses between three strains of *G. arboreum* var. *neglectum* was conducted on a plan decided upon by Mr. J. B. Hutchinson in consultation with Professor Fisher of London. The data await analysis. The results of the first experiment in this series have been sent for publication. The results of the 1936-37 experiments were partially analysed during the year and they appear to confirm the previous findings. Heterosis was again demonstrated in almost all the agricultural characters studied. There was generally no difference between the reciprocal crosses.

From the F_2 progenies of the above crosses, plants were selected for high and low values in halo-length and ginning percentage and their progenies grown in a replicated trial. Examination of halo-length data has shown that selection of individual plants for high and low values was efficient. The progenies selected for ginning percentage occupied a position between those selected for halo-length but selection for high ginning percentage has tended to give a lower halo-length and *vice versa* which probably indicates that some of the genes for ginning percentage must be negatively correlated with those for lint length. The data require further analysis.

Previous analysis had shown that the magnitude of the heterosis was roughly proportional to the variance of the F_2. Also the mean values of the F_1 and F_2 were closely correlated. The value of an F_2 for selection in plant breeding work is therefore proportional to its mean and genetic variance. Since these can be roughly estimated from the mean value and heterosis of the F_1, the actual comparison of the F_1s from different crosses should give a good indication of the most profitable combinations for selection. This was actually put to test by comparing the F_1s obtained from Sri Ganganagar by crossings among selected Rajputana strains, Shan State's material, Cwn. 520 and Mollisoni in a special experiment. Owing to the great differences in the number of seeds available from each cross and poor germination combined with incidence of wilt in some of the plots, very definite results could not be obtained. The indications were that there was no difference between Mollisoni and Cwn. 520, in its value as a hybrid parent, the only difference in germination in favour of Mollisoni vanishing when yields were adjusted to stand. But between Rajputana or Shan State's material, the difference was in favour of Shan State for most of the characters and particularly for lint length which is the main character to go for in the improvement of Bengals. This experiment will be repeated with the F_1 seeds obtained during the year and also to test if the indications obtained from F_1s are confirmed by F_2 behaviour.

Breeding for wilt resistance.

This work is assuming greater and greater importance as the wilt incidence is becoming general. Malvi 9 bulk shows only about 50 per cent. survival in a wilt infected field. One of the selections from Malvi 9 has given a progeny with 76 per cent. survival. Side by side single plant selections had been made in two seasons, 1933 and 1936, from cultivators' fields showing incidence of wilt. Progeny row trials have been conducted with the pick of the material in both wilt free and wilt infected fields on the farm. Progenies have now been obtained from ten of these families which give 80 to 90 per cent. survival

in wilt infected fields. Since selections had been made even in the original material for a satisfactory lint length and ginning percentage comparable with those of Malvi 9, these new progenies should prove a real improvement from the wilt resistance point of view.

Examination of the root system of a large number of surviving plants from susceptible and resistant Malvi strains has confirmed the indications previously obtained that resistance is associated with a better root system, namely, larger and longer tap root and larger and a greater number of lateral roots. That the differences are apparent even between progenies of the same strain (Malvi 9 and Malvi 9—6) should mean that the two characters are inter-related.

Genetics.

The study of inheritance and linkage relationships of a number of characters has been pursued and definite results have been obtained with some of them. The fuzzy nature of the seed studied in Buri cottons (*G. hirsutum*), has proved a double recessive. A chlorophyll deficient type isolated from the cross Malvi 9 x Cernuum has proved a simple recessive. Regarding the leaf shape allelomorph series, there has been recognised a still additional member, Dacca narrow, belonging to the same series, with a leaf index coming between 1090 and the typical narrow. This member does not have also accessary lobes. Additional information on the petal colour depressing gene, petal spot genes and genes for clustering habit and hairiness has been obtained from the large F_2 population of *arboreum* x *anomalum* cross.

Physiology.

Effect of land on quality Upland cotton.—Technological examination has shown that American (Upland) types grown on *adhan* land at Kharua (Malwa) in 1936-37 had a longer staple, were finer and gave a higher spinning value than the same types grown on *barani* land at Indore. The trial has been repeated and the lint will be sent to the Technological Laboratory for confirmation of the result.

Study of the quality in cotton fibre.—Swollen hair diameter as a measure of fineness of the fibre failed to give any consistent correlation either with fibre weight or with spinning value and the technique has now been discontinued. An attempt is being made to evolve a rapid method of fibre weight determination by weighing bunches of hairs pulled out from the seed and using a torsion balance. A large number of measurements has been taken on the material from a replicated trial and their analysis should indicate how far the method can be useful for plant breeders.

Competition between Desi and Upland cotton.—The experiments reported last year were repeated at Indore and at Kukshi in Nimar. In all experiments the Upland type suffered significantly less both in red-leaf and leaf-roll with increased association with *desi* and thus previous results were confirmed. In the yield of seed cotton there was no indication of any change in *desi* as a result of competition with Upland; but the Upland type gave a significant increase in the number of bolls per plant with greater association with *desi* in Nimar. Both in Nimar and at the better land trial at Indore the yield of Upland showed an increase in the same direction but the differences were not significant. The experiment will be continued using unselected *desi* and Upland components from the local population along with the selected strains. A similar experiment was conducted at Sri Ganganagar but failed on account of the very poor germination of the Upland (P. A. 289F) type used in the experiment.

Two years' results had shown that the population of Upland either tended to go down or go up according as the original mixture contained it in a very much higher or a lower proportion than what is usually met with. This year both in the field stand and the seed counts in the harvested produce, the proportion of Upland has gone down considerably with a corresponding increase in the *desi*. The difference is even more striking in a bad field than in a good field. This can be accounted for by the fact that there was frost in 1936-37 season which should have affected the Upland type much more than the *desi* resulting in poor and immature seed in the former. The difference between good and bad field must be due to the Upland type having suffered more than the *desi* in the latter land with too much of early rains soon after sowing.

PROGRAMME OF WORK FOR 1939-40.

GENETICS AND BOTANY SECTION.—COTTON.

(1) *Genetics.*—

Study of the major factors in Asiatic and Indian American cotton.

Leaf shape; anthocyanin pigmentation; hairiness and lintlessness; tufted seed.

Wilt resistance in *arboreum* cotton.

Study of the problem of heterosis.

Study of the association of economic and morphological characteristics in crosses.

Testing the value of hybrid material from a comparative study of F_1s and its bearing on future selection.

Producing mutation by x-rays and colcicine treatment.

(2) *Cytology.*—

Study of the crosses between G. *anomalum* with Asiatic cottons.

Study of the interspecific hybrid Asiatic x American to be obtained from Broach.

(3) *Physiology.*—

Investigations into the measurements of fibre weight.

Study of competition effects between *desi* and Upland cotton in mixed crop.

Study of the survival of the Upland and *desi* in the mixture.

Study of the new-place-effect on certain standard strains in Rajputana and Malwa.

Cwn. 520, Mollisoni and Punjab American. Malvi, Nimar Roseum and M. U. strain.

(4) *Selection and Breeding.*—

Propagation and distribution of Malvi 9.

Improvement of ginning percentage and wilt resistance in Malvi 9 by crossing.

Study of new selections in *desi* cotton made in Malwa and Nimar.

Study of Upland selections in Dhar.

Selection for resistance to wilt.

(5) *Statistics.*—

Study of optimum sampling in experiments in cotton, with reference to observations on growth in breeding experiments.

Study of the effect of selection in genetic variance in cross progenies.

Statistical analysis of the existing data on genetical variance and uniformity trials.

OTHER CROPS.

Selection and breeding work will be continued on the following crops :—

Kharif.	*Rabi.*
Jowar.	Wheat.
Bajra.	Gram.
Tuer.	Linseed.
Groundnut.	Kesari.
Niger.	

The improved strains obtained in Jowar, Tuer and Linseed will be multiplied.

PROGRAMME OF WORK FOR 1939-40.

(TENTATIVE).

Field Experiments :—(Repetition of some of the experiments carried out in 1938).

Indore.—Yield response of cotton Malvi 9.

1. Comparison of compost, local oil cakes and nicifos grades—on two fields, rich and poor.

2. Comparison of ammonium sulphate, superphosphate and potassium sulphate, used alone and in combination at different rates,—1—repetition on three fields, rich, medium and poor.

3. Investigations into methods of improving waterlogged soils for successful cotton growing.

4. Response to humic and inorganic nitrogen applied at different rates, alone or together before or after preparatory tillage. Variety M 9/20, repetition with amplifications on four fields, rich, poor, medium and waterlogged.

5. Influence of different rates of compost with or without ammonium sulphate on unirrigated wheat grown on rich and poor lands and with superphosphate in addition on waterlogged land. Preliminary tests with linseed to ascertain the possibility of yield response to compost or ammonium sulphate on rich and poor lands.

Mandore Farm, Jodhpur :—

6. Effect of commercial manures at different rates on Cambodia cotton.

Kotputli Farm or Mirapur Farm, Khetri :—

7. Effect of local types of humic manures and of sarson cake at different rates on both Cambodia and Cwn. 520 cottons.

Sri Ganganagar :—

8. The possible use of a nurse crop to cotton—preliminary tests.

9. Nitrogen requirement of Desi and American varieties of cotton rates and kinds. Residual effect, if possible, on wheat following.

10. Time of application for ammonium sulphate to cotton.

11. Nitrogen requirement of wheat and residual effect on the cotton following.

12. Composition at different times during cotton growth of canal waters and their effect on the soils—irrigated.

Soil and Plant observations :—

On No. 4 at Indore soil moistures and nitrates at different periods wet and dry. Dry weights of plant parts and nitrogen contents at different developmental stages.

Soil and water analyses for Sri Ganganagar samples (Nos. 9 and 12).

Properties of regional Soil types.

Routine analyses, design and statistical analyses, and reporting on trials.

APPENDIX V.

TABLE I.

Showing changes in yields of Cotton in India.

Year (*September 1st to August 31st*).	Area (thousand acres).	Production Govt. Estimates (thousand bales of 400 lbs. each).	Yield per acre (lbs.) Col. 3÷ Col. 2.	Production of cotton (Based on Govt. Estimates. Staple, $\frac{7}{8}$ inch and above).		*Approximate (Commercial) Crop. (thousand bales of 400 lbs. each.)	Yield per acre. (Calculated from approximate commercial Crop) lbs. Col. 7÷ Col. 2.
				Actual (thousand bales of 400 lbs. each.)	Per cent. on Total.		
1	2	3	4	5	6	7	8
Av. 1923-28 ..	25,684	5,690	89	1,604	28	5,832	91
Av. 1928-33 ..	24,598	4,983	81	1,339	27	5,915	96
1933-34 ..	24,137	5,108	85	1,365	27	6,192	103
1934-35 ..	23,972	4,857	81	1,244	26	6,177	103
† 1935-36 ..	25,444	5,824	92	1,827	31	6,837	108
† 1936-37 ..	24,759	6,204	100	2,104	34	7,348	119
† 1937-38 ..	25,583	5,663	89	1,775	31	5,544	87
Av. 1933-38 ..	24,779	5,531	89	1,663	30	6,420	104

† Excludes Burma.

* Calculated from mill consumption + exports + extra-factory consumption. The new figure for extra-factory consumption, *viz.*, 450,000 bales for the whole of India, arrived at on the basis of enquiries conducted by the Committee in selected areas, has been used throughout.

APPENDIX V—(*contd.*)

TABLE II.

Showing change in the character of the Indian Cotton Crop.

Indian Cotton Crop classified according to varieties and length of staple, 1933-38.

(Based chiefly on the "Estimates of Area and Yield of Principal Crops in India" and "Cotton Forecasts" published by the Department of Commercial Intelligence and Statistics in India.)

(Excludes Burma.) In thousand bales* of 400 lbs. each.

Trade Descriptions.	Average of 1933-34 to 1935-36.	1936-37.	1937-38.	Percentage increase of 1937-38 Crop over the Average of 1933-34 to 1935-36.
Short Staple, below $\frac{7}{8}$ inch.—				
1. Oomras, Khandesh	269	280	339	
2. ,, Central India ..	233	307	218	
3. ,, Barsi & Nagar ..	372	338	389	
4. ,, C. P. & Berar† ..	641	838	689	
5. Broach (Part)	130	150	222	
6. Kumpta-Dharwar (Part) ..	(*a*)	13	19	
7. Westerns & Northerns (Part) ..	(*b*)	115	155	
8. Dholleras	595	436	471	
9. Bengals, United Provinces ..	219	176	201	
10. ,, Rajputana	82	85	78	
11. ,, Sind-Punjab	995	1,246	981	
12. ,, Others	13	15	11	
13. Comillas, etc.	39	41	55	
14. Coconadas	26	25	25	
15. Salems	33	35	35	
Total, Short Staple ..	3,647	4,100	3,888	7
Medium and Long Staple, $\frac{7}{8}$ inch and above.—				
16. Oomras, Hyderabad Gaorani ..	131	141	142	
17. ,, Verum Selections ..	23	37	22	
18. Broach (Part)	115	211	151	
19. Kumpta-Dharwar (Part) ..	159	139	135	
20. Westerns & Northerns (Part) ..	218	44	35	
21. Tinnevellies (including Karunganni)	136	138	134	
22. Cambodias	181	198	225	
23. Americans (Punjab & Sind) 4F.	535	999	703	
24. Punjab-American 289F-43 ..	..	11	47	
25. Punjab-American 289F‡ ..	14	47	54	
26. Punjab-American L.S.S. ..	..	39	50	
27. Sind-American 289F‡§.. ..	39	100	77	
Total, Medium & Long Staple..	1,551	2,104	1,775	14
GRAND TOTAL ..	5,198	6,204	5,663	9

* Statistical bales containing 400 lbs. of cleaned (lint) cotton.
† Excludes Verum Selections.
‡ Staple length over 1″.
§ From 1936-37 classed as 1 inch in staple.
(*a*) Included under item 19. (*b*) Included under item 20.

APPENDIX VI.

INDIAN RAW COTTON CONSUMED IN INDIAN MILLS.

(Based on returns made under the Indian Cotton Cess Act, 1923, by mills in British India, and on voluntary returns from mills in Indian States).

Cotton Year : 1st September to 31st August.

(In Bales of 400 lbs. nett.)

——	1923-24.	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	† 1936-37	1937-38.
Bombay Island ..	762,610	987,355	731,937	747,988	435,426	542,036	766,375	664,546	611,606	565,084	491,709	687,287	664,199	636,720	782,815
Ahmedabad	262,745	273,639	286,800	264,139	298,075	318,983	344,021	321,503	322,257	348,009	373,345	326,558	320,982	304,398	345,980
Bombay Province ..	1,180,410	1,424,447	1,189,539	1,167,892	894,671	1,044,925	1,300,859	1,173,659	1,132,645	1,116,297	1,063,549	1,230,616	1,189,310	1,128,744	1,353,709
Madras Province ..	149,721	162,876	176,274	185,207	194,591	204,284	211,488	214,759	260,707	292,013	278,060	312,164	365,423	410,779	417,602
United Provinces ..	160,522	177,064	191,740	204,702	170,846	182,462	234,205	235,623	256,820	273,573	277,230	292,424	317,011	299,073	288,320
Central Provinces and Berar	94,635	106,052	109,995	111,292	116,888	121,391	123,146	118,492	115,018	111,208	112,660	125,014	130,298	122,987	146,587
Bengal..	72,535	83,553	77,949	89,763	82,086	84,212	99,075	91,993	102,390	103,784	107,633	101,101	98,892	79,944	92,036
The Punjab and Delhi	23,388	30,663	35,394	40,687	45,638	54,575	64,464	73,736	89,681	80,854	71,939	83,897	89,430	93,886	94,742
Rest of British India	12,227	14,414	17,313	13,190	15,040	22,189	24,458	27,101	30,342	31,035	35,139	38,575	38,010	35,823	46,840
Total—British India	1,693,438	1,999,069	1,798,204	1,812,733	1,519,760	1,714,038	2,057,695	1,935,363	1,987,603	2,009,664	1,946,210	2,183,791	2,228,374	2,171,236	2,439,836
Total—Indian States*	142,505	175,609	187,614	229,443	251,589	277,540	315,399	333,996	358,793	351,260	390,116	428,341	449,314	460,060	554,003
TOTAL—INDIA ..	1,835,943	2,174,678	1,985,818	2,042,176	1,771,349	1,991,578	2,373,094	2,269,359	2,346,396	2,360,924	2,336,326	2,612,132	2,677,688	2,631,296	2,993,839

* Figures for Indian States up to and including 1930-31, being based on yarn production returns, include foreign cotton also.
‡ From April 1937 figures for Burma have been excluded.

INDIAN RAW COTTON CONSUMED IN MILLS IN INDIAN STATES.

(Based on voluntary returns from mills in Indian States).

N.B.—Figures up to and including 1930-31, being based on yarn production, include foreign cotton also.

Cotton Year : 1st September to 31st August.

(In Bales of 400 lbs. nett.)

——	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.	1937-38.
Hyderabad	15,210	16,697	19,067	20,823	23,074	31,290	33,488	33,231	45,588	51,771	49,981	63,093
Mysore	43,571	44,320	39,619	46,590	43,326	49,293	50,596	47,168	51,196	50,824	53,236	55,244
Baroda	46,070	46,884	48,852	59,043	62,578	58,534	50,587	53,612	57,146	51,963	51,761	70,686
Gwalior	24,257	25,716	36,708	41,463	45,207	45,892	43,306	49,362	56,318	72,163	79,079	89,243
Indore	53,526	65,391	76,070	83,026	88,620	95,296	91,036	111,430	114,229	113,379	106,454	147,766
Kathiawar States	} 46,809	52,581	57,224	64,454	{ 20,283	18,849	18,868	26,506	35,438	37,397	42,717	48,545
Other Indian States					32,558	39,382	40,209	45,197	45,735	51,462	57,767	57,119
Pondicherry					18,350	20,257	23,170	23,610	22,691	20,355	19,065	22,307
Total—Indian States	229,443	251,589	277,540	315,399	333,996	358,793	351,260	390,116	428,341	449,314	460,060	554,003

LOOSE (UNPRESSED) INDIAN RAW COTTON RECEIVED IN SPINNING MILLS IN BRITISH INDIA.

(Based on voluntary returns furnished by mills.)

Cotton Year : 1st September to 31st August.

(In Bales of 400 lbs. nett.)

——	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	‡1936-37.	1937-38.
Bombay Province	28,328	24,970	27,324	24,361	54,409	74,979	80,092	74,868	58,355	75,617	76,227	82,165
Madras Province	35,198	39,560	52,188	46,582	55,717	99,389	96,340	110,875	123,260	147,044	173,102	156,675
United Provinces	16,991	10,308	13,878	20,441	18,496	14,367	19,236	17,871	10,090	10,405	10,659	15,719
Central Provinces and Berar	40,762	20,861	6,924	16,243	15,771	20,743	17,462	18,382	20,544	27,502	26,321	32,860
Bengal*	..	..	..	..	..	..	..	..	..	..	90	..
The Punjab and Delhi†	3,910	4,739	3,760	4,361	4,307	2,317	2,149	..	5,535	3,110	28,385	23,873
Rest of British India*	..	..	..	..	..	..	..	..	..	..	19,282	17,160
Total—British India	125,189	100,438	104,074	111,988	148,700	211,795	215,279	221,996	217,784	263,678	334,066	328,452
Indian States*	..	..	..	..	..	..	..	..	..	..	131,149	109,002
Total—India*	..	..	..	..	..	..	..	..	..	..	465,215	437,454

* Figures up to 1935-36 not compiled.

† Figures up to 1935-36 exclude Delhi.

‡ From 1936-37 the figures refer to consumption and not receipts and are based on returns furnished under the Indian Cotton Cess Act, 1923, by mills in British India and on voluntary returns from mills in Indian States. From April 1937 figures for Burma have been excluded.

APPENDIX VII.

STOCKS OF INDIAN RAW COTTON HELD IN INDIA BY THE MILLS AND THE TRADE ON 31st AUGUST, 1937 AND 1938.

(In thousand bales * of 400 lbs. each.)

Trade Descriptions of Cotton.	Trade Stocks on 31st August.								Mill Stocks on 31st August.		Total Trade and Mill Stocks on 31st August.	
	Bombay Island.		Karachi.		Rest of India.		Total India.		Total India.			
	1937.	1938.	1937.	1938.	1937.	1938.	1937.	1938.	1937.	1938.	1937.	1938.
BENGALS—												
United Provinces ..	—	—	—	—	(a) 4	—	4	—	18	38	22	38
Punjab	—	—	35	83	(b) 6	(b)24	41	107	21	60	62	167
Sind	—	—	10	26	—	—	10	26	4	4	14	30
Rajputana	—	—	2	—	—	—	2	—	12	16	14	16
Others (Unclassified) ..	38	26	—	1	—	—	38	27	7	4	45	31
Total ..	38	26	47	110	10	24	95	160	62	122	157	282
OOMRAS—												
Central Provinces Oomras	15	26	—	—	(d) 5	(d) 9	20	35	31	59	51	94
Berar Oomras	38	27	—	—	(e) 9	(e)32	47	59	15	34	62	93
Khandesh—Banilla ..	—	—	—	—	—	—	—	—	6	7	6	7
Khandesh—Oomras ..	29	41	—	—	(f) 2	(f) 3	31	44	9	17	40	61
Central India—Malvi ..	—	—	—	—	(g) 4	(g) 2	4	2	49	28	53	30
Central India—Others ..	37	19	—	—	(g) 28	(g)10	65	29	21	19	86	48
Barsi and Nagar Oomras	28	33	—	—	(h) 45	(h)107	73	140	6	16	79	156
Total ..	147	146	—	—	93	163	240	309	137	180	377	489
VERUM	—	—	—	—	—	—	—	—	11	10	11	10
HYDERABAD GAORANI ..	4	—	—	—	(h) 5	(h)19	9	19	56	82	65	101
Total ..	4	—	—	—	5	19	9	19	67	92	76	111
AMERICANS—												
Punjab—289-F	2	11	1	8	—	(b) 1	3	20	33	71	36	91
Punjab L. S. S. ..	—	—	—	—	—	(b) 1	—	1	—	29	—	30
Punjab (Unspecified—4-F)	1	5	35	59	(b) 26	(b)10	62	74	103	193	165	267
Sind-Sudhar (289-F-1) ..	9	20	—	6	—	—	9	26	14	15	23	41
Sind (Unspecified & 4-F-98)	2	7	25	16	—	(c) 1	27	24	34	30	61	54
Dharwar (Gadag 1) ..	—	—	—	—	—	—	—	—	3	9	3	9
Dharwar (Upland—Unspecified)	—	—	—	—	—	(l) 8**	—	8	4	9	4	17
Cambodia (Coimbatore No. 2)	—	—	—	—	—	—	—	—	48	71	48	71
Cambodia (Unspecified).	5	3	—	—	(i) 31	(i)55	36	58	26	24	62	82
Total ..	19	46	61	89	57	76	137	211	265	451	402	662
BROACH—												
Surat-Navsari (Surti) ..	29	6	—	—	—	—	29	6	49	51	78	57
Broach (Unspecified) ..	111	96	—	—	—	—	111	96	62	87	173	183
Total ..	140	102	—	—	—	—	140	102	111	138	251	240
DHOLLERAS—												
Mattheo	32	24	—	—	—	—	32	24	3	7	35	31
Cutch	—	—	—	—	—	—	—	—	—	—	—	—
Wagad	—	—	—	—	—	—	—	—	34	39	34	39
Dholleras (Unspecified)	56	48	—	—	(c) 8	(c)11	64	59	6	7	70	66
Total ..	88	72	—	—	8	11	96	83	43	53	139	136
SOUTHERNS—												
Kumptas (Jayawant) ..	—	—	—	—	—	(m)1	—	1	29	26	29	27
Kumptas (Unspecified)	9	18	—	—	(k) 1	(l)‡5	10	23	41	46	51	69
Westerns (Jowari and Mungari)	15	12	—	—	(i)¶43	(i)§39	58	51	58	69	137	132
Northerns									21	12		
Coconadas (and Warangal)	—	—	—	—	(i)†13	(i)‖33	13	33	7	7	20	40
Karunganni	—	—	—	—	—	—	—	—	26	27	26	27
Tinnevellies	1	1	—	—	(i) 15	(i)37	16	38	26	45	42	83
Salems	—	—	—	—	(i) 9	(i)12	9	12	1	6	10	18
Total ..	25	31	..	..	81	127	106	158	209	238	315	396
COMILLAS	—	1	—	—	—	—	—	1	—	—	—	1
OTHER SORTS (Unclassified)	5	9	—	—	—	—	5	9	3	4	8	13
Total Indian Cotton	466	433	108	199	254	420	828	1,052	897	1,278	1,725	2,330

*Standard Indian bales of approximate average gross weight 400 lbs. and net weight 392 lbs. of cleaned (lint) cotton.

N.B.—The detailed statement of Mill stocks on 31st August 1938 is attached.

(a) At Cawnpore.
(b) In the Punjab.
(c) At Ahmedabad.
(d) In the Central Provinces (Includes 965 bales in Ahmedabad.)
(e) In Berar.
(f) In East & West Khandesh districts.
(g) In Indore and Gwalior States.
(h) In Hyderabad State.
(i) In Madras Presidency.
(j) In Indore State.
(k) At Bailhongal.
(l) At Gadag.
(m) At Hubli.

¶ Includes 32,000 bales in Hyderabad State.
† „ 1,000 „ „ „
‡ „ 2,000 bales at Hubli and 927 bales at Bailhongal.
§ 20,000 „ in Hyderabad State.
‖ „ 15,000 „ „ „ „
** „ 475 „ at Hubli.

(Figures for 1938 for Gwalior State are not yet available).

STOCKS OF RAW COTTON HELD BY THE

(Compiled from Voluntary

(*In thousand bales**

Trade Descriptions of Cotton.	Bombay Island.	Ahmedabad.	Rest of Bombay Presidency.	Total Bombay Presidency.	Madras North.	Madras South.	Total Madras Presidency.	United Provinces.	Central Provinces.	Berar.	Total C. P. and Berar.	Bengal.
BENGALS—												
United Provinces ..	4	—	—	4	—	—	—	29	—	—	—	1
Punjab	7	—	—	7	—	—	—	20	—	—	—	2
Sind	3	1	—	4	—	—	—	—	—	—	—	—
Rajputana	4	—	—	4	—	—	—	—	—	—	—	—
Others (Unclassified) ..	1	—	—	1	—	—	—	3	—	—	—	—
Total ..	19	1	—	20	—	—	—	52	—	—	—	3
OOMRAS—												
Central Provinces Oomras	4	—	3	7	—	—	—	1	47	1	48	2
Berar Oomras	4	—	6	10	—	—	—	—	11	11	22	1
Khandesh—Banilla ..	2	—	5	7	—	—	—	—	—	—	—	—
Khandesh—Oomras ..	4	—	13	17	—	—	—	—	—	—	—	—
Central India—Malvi ..	1	1	1	3	—	—	—	3	—	—	—	—
Central India—Others ..	2	1	1	4	—	—	—	4	—	—	—	—
Barsi and Nagar Oomras	3	—	12	15	—	—	—	—	—	—	—	—
Total ..	20	2	41	63	—	—	—	8	58	12	70	3
VERUM	—	—	1	1	—	—	—	—	7	2	9	—
HYDERABAD GAORANI ..	6	—	28	34	2	—	2	—	8	1	9	—
Total ..	6	—	29	35	2	—	2	—	15	3	18	—
AMERICANS—												
Punjab—289-F	28	4	1	33	1	1	2	30	1	—	1	3
Punjab L. S. S. ..	11	1	—	12	1	—	1	8	—	—	—	1
Punjab (Unspecified—4-F)	30	2	1	33	—	9	9	117	1	—	1	6
Sind-Sudhar (289-F-1)	14	1	—	15	—	—	—	—	—	—	—	—
Sind (Unspecified & 4-F-98)	13	1	—	14	1	11	12	1	—	—	—	—
Dharwar (Gadag i) ..	5	—	3	8	—	—	—	—	—	—	—	—
Dharwar (Upland—Unspecified)	2	—	4	6	1	1	2	—	—	—	—	—
Cambodia (Coimbatore No. 2)	1	—	—	1	—	68	68	—	—	—	—	—
Cambodia (Unspecified)	1	—	—	1	—	21	21	—	—	—	—	1
Total ..	105	9	9	123	4	111	115	156	2	—	2	11
BROACH—												
Surat-Navsari (Surti) ..	18	19	3	40	1	1	2	—	1	—	1	—
Broach (Unspecified) ..	51	21	1	73	—	2	2	—	1	—	1	1
Total ..	69	40	4	113	1	3	4	—	2	—	2	1
DHOLLERAS—												
Mattheo	5	1	—	6	—	—	—	—	—	—	—	—
Cutch	—	—	—	—	—	—	—	—	—	—	—	—
Wagad	2	24	1	27	—	—	—	—	—	—	—	—
Dholleras (Unspecified)	3	1	1	5	—	—	—	—	—	—	—	—
Total ..	10	26	2	38	—	—	—	—	—	—	—	—
SOUTHERNS—												
Kumptas (Jayawant) ..	9	—	2	11	9	—	9	—	—	—	—	—
Kumptas (Unspecified)	16	—	13	29	1	—	1	—	—	—	—	—
Westerns (Jowari and Mungari)	11	1	26	38	9	1	10	—	—	—	—	—
Northerns	1	—	—	1	9	1	10	—	—	—	—	—
Coconadas (and Warangal)	1	—	1	2	—	—	—	—	—	—	—	1
Karunganni	—	—	—	—	1	25	26	—	—	—	—	—
Tinnevellies	—	—	—	—	—	41	41	—	—	—	—	4
Salems	1	—	—	1	—	5	5	—	—	—	—	—
Total ..	39	1	42	82	29	73	102	—	—	—	—	5
COMILLAS	—	—	—	—	—	—	—	—	—	—	—	—
OTHER SORTS (UNCLASSIFIED)	—	—	1	1	—	1	1	—	—	—	—	—
Total Indian Cotton ..	268	79	128	475	36	188	224	216	77	15	92	23
AMERICANS	59	1	1	61	—	1	1	—	—	—	—	1
EGYPTIANS	14	12	1	27	3	5	8	—	1	—	1	1
EAST AFRICANS	27	29	8	64	—	4	4	—	1	—	1	4
OTHERS (Sudan, Mesopotamia, etc.)	9	3	1	13	1	3	4	—	—	—	—	1
Total Foreign Cotton.	109	45	11	165	4	13	17	—	2	—	2	7
GRAND TOTAL ..	377	124	139	640	40	201	241	216	79	15	94	30

* Standard Indian bales of approximate average gross weight

MILLS IN INDIA ON 31st AUGUST, 1938.

Returns furnished by Mills.)

of 400 *lbs. each.*)

Punjab and Delhi.	Rest of British India.	Total British India.	Hyderabad.	Mysore.	Baroda.	Gwalior.	Indore.	Kathiawar States.	Other Indian States.	Pondicherry.	Total Indian States.	Grand Total.	Trade Descriptions of Cotton.
4	—	38	—	—	—	—	—	—	—	—	—	38	BENGALS— United Provinces
23	5	57	—	1	—	2	—	—	—	—	3	60	Punjab
—	—	4	—	—	—	—	—	—	—	—	—	4	Sind
—	10	14	—	—	—	1	—	—	1	—	2	16	Rajputana
—	—	4	—	—	—	—	—	—	—	—	—	4	Others
27	15	117	—	1	—	3	—	—	1	—	5	122	Total
—	—	58	—	1	—	—	—	—	—	—	1	59	OOMRAS— Central Provinces Oomras
—	—	33	—	—	—	—	—	—	1	—	1	34	Berar Oomras
—	—	7	—	—	—	—	—	—	—	—	—	7	Khandesh—Banilla
—	—	17	—	—	—	—	—	—	—	—	—	17	Khandesh—Oomras
—	—	6	—	—	—	9	12	—	1	—	22	28	Central India—Malvi
—	—	8	—	—	1	—	9	—	1	—	11	19	Central India—Others
—	—	15	1	—	—	—	—	—	—	—	1	16	Barsi and Nagar Oomras
—	—	144	1	1	1	9	21	—	3	—	36	180	Total
—	—	10	—	—	—	—	—	—	—	—	—	10	VERUM
—	—	45	37	—	—	—	—	—	—	—	37	82	HYDERABAD GAORANI
—	—	55	37	—	—	—	—	—	—	—	37	92	Total
1	—	70	—	—	—	1	—	—	—	—	1	71	AMERICANS— Punjab—289-F.
6	—	28	—	—	—	1	—	—	—	—	1	29	Punjab L. S. S.
12	5	183	—	1	—	5	—	—	2	2	10	193	Punjab (Unspecified—4-F)
—	—	15	—	—	—	—	—	—	—	—	—	15	Sind-Sudhar (289-F-1)
—	—	27	—	1	—	—	—	—	1	1	3	30	Sind (Unspecified & 4-F-98)
—	—	8	—	1	—	—	—	—	—	—	1	9	Dharwar (Gadag 1)
—	—	8	—	1	—	—	—	—	—	—	1	9	Dharwar (Upland—Unspecified).
—	—	69	—	1	—	—	—	—	1	—	2	71	Cambodia (Coimbatore No. 2)
—	—	23	—	—	—	—	—	—	1	—	1	24	Cambodia (Unspecified)
19	5	431	—	5	—	7	—	—	5	3	20	451	Total
—	—	43	—	—	2	1	1	2	—	2	8	51	BROACH— Surat-Navsari (Surti)
—	2	79	—	—	5	—	1	2	—	—	8	87	Broach (Unspecified)
—	2	122	—	—	7	1	2	4	—	2	16	138	Total
—	—	6	—	—	—	—	—	1	—	—	1	7	DHOLLERAS— Mattheo
—	—	—	—	—	—	—	—	—	—	—	—	—	Cutch
—	—	27	—	—	5	—	—	7	—	—	12	39	Wagad
—	—	5	—	—	2	—	—	—	—	—	2	7	Dholleras (Unspecified)
—	—	38	—	—	7	—	—	8	—	—	15	53	Total
—	—	20	—	6	—	—	—	—	—	—	6	26	SOUTHERNS— Kumptas (Jayawant)
—	—	30	—	11	—	—	—	—	5	—	16	46	Kumptas (Unspecified)
—	—	48	2	19	—	—	—	—	—	—	21	69	Westerns (Jowari and Mungari)
—	—	11	—	1	—	—	—	—	—	—	1	12	Northerns
—	—	3	3	—	—	—	—	—	—	1	4	7	Coconadas (and Warangal)
—	—	26	—	—	1	—	—	—	—	—	1	27	Karunganni
—	—	45	—	—	—	—	—	—	—	—	—	45	Tinnevellies
—	—	6	—	—	—	—	—	—	—	—	—	6	Salems
—	—	189	5	37	1	—	—	—	5	1	49	238	Total
—	—	—	—	—	—	—	—	—	—	—	—	—	COMILLAS
—	—	2	—	2	—	—	—	—	—	—	2	4	OTHER SORTS
46	22	1,098	43	46	16	20	23	12	14	6	180	1,278	Total Indian Cotton
—	—	63	—	—	—	—	—	—	—	—	—	63	AMERICANS
—	—	37	—	2	2	—	—	—	—	—	4	41	EGYPTIANS
1	—	74	—	1	4	—	—	2	—	—	7	81	EAST AFRICANS
—	—	18	—	—	1	—	—	—	—	—	1	19	OTHERS (Sudan, Mesopotamia, etc.)
1	—	192	—	3	7	—	—	2	—	—	12	204	Total Foreign Cotton
47	22	1,290	43	49	23	20	23	14	14	6	192	1,482	GRAND TOTAL

400 lbs. and not weight 392 lbs. of cleaned (lint) cotton.

STOCKS OF INDIAN COTTON ON 31ST JANUARY HELD BY THE MILLS AND THE TRADE IN THE MADRAS PROVINCE.

(In thousand bales of 400 lbs. each.)

Trade Descriptions of Cotton.	Mill stocks on 31st January.				Trade stocks on 31st January.				Total stocks on 31st January.			
	1935.	1936.	1937.	1938.	1935.	1936.	1937.	1938.	1935.	1936.	1937.	1938.
Tinnevellies	21	14	28	22	7	12	4	18	28	26	32	40
Salems	10	6	8	15	2	3	2	3	12	9	10	18
Cambodias	42	41	47	46	11	22	11	14	53	63	58	60
*Northerns & Westerns	14	14	22	24	..	..	11	12	14	14	33	36
*Coconadas	†	†	†	†	..	..	10	12	..	..	10	12
*Outside cottons ..	41	28	34	50	..	..	..	..	41	28	34	50
Total ..	128	103	139	157	20	37	38	59	148	140	177	216

* Mill stocks figures only were collected for 1935 and 1936. † Less than 500 bales.

APPENDIX VIII.

EXPORTS BY SEA OF INDIAN RAW COTTON CLASSIFIED BY VARIETIES.

(Compiled from Voluntary Returns furnished by Exporters.)

1st *September* 1937 *to* 31st *August* 1938.

(In thousand bales* of 400 lbs. each.)

Trade Descriptions of Cotton.	Exported to				Total Exports.
	Europe (excluding United Kingdom) and the West.	United Kingdom.	Japan.	China and the East (excluding Japan).	
BENGALS—					
United Provinces	5	2	13	1	21
Punjab	186	61	155	10	412
Sind	122	48	6	3	179
Rajputana	7	1	2	—	10
Others (Unclassified)	3	—	—	—	3
Total ..	323	112	176	14	625
OOMRAS—					
Central Provinces—Oomras ..	44	27	39	—	110
Berar—Oomras	35	7	221	9	272
Khandesh—Banilla	7	—	5	—	12
Khandesh—Oomras ..	28	7	172	5	212
Central India—Malvi	7	1	4	—	12
Central India—Others	12	4	20	11	47
Barsi and Nagar—Oomras ..	10	2	62	1	75
Total ..	143	48	523	26	740
VERUM	—	—	—	—	—
HYDERABAD GAORANI	1	—	1	—	2
Total ..	1	—	1	—	2
AMERICANS—					
Punjab—289-F	1	1	1	—	3
Punjab L. S. S.	—	—	—	—	—
Punjab (Unspecified—4-F) ..	67	113	38	24	242
Sind Sudhar—(289-F-1) ..	2	1	2	2	7
Sind (Unspecified and 4-F-98)	9	20	1	10	40
Dharwar (Gadag 1)	—	—	—	—	—
Dharwar (Upland-Unspecified)	—	—	—	—	—
Cambodia (Coimbatore No. 2)..	—	—	—	—	—
Cambodia (Unspecified) ..	2	—	—	—	2
Total ..	81	135	42	36	294
BROACH—					
Surat-Navsari (Surti) ..	4	1	1	—	6
Broach (Unspecified)	29	7	18	12	66
Total ..	33	8	19	12	72
DHOLLERAS—					
Mattheo	56	2	13	—	71
Cutch	—	—	3	—	3
Wagad	—	—	1	—	1
Dholleras (Unspecified) ..	3	—	15	5	23
Total ..	59	2	32	5	98
SOUTHERNS—					
Kumptas (Jayawant)	—	—	—	—	—
Kumptas (Unspecified) ..	—	—	—	—	—
Westerns (Jowari and Mungari).	13	—	6	—	19
Northerns	6	—	—	—	6
Coconadas (and Warangal) ..	8	11	—	—	19
Karunganni	1	—	—	—	1
Tinnevellies	4	1	—	—	5
Salems	—	—	1	—	1
Total ..	32	12	7	—	51
COMILLAS	25	6	—	1	32
OTHER SORTS (Unclassified) ..	7	—	47	—	54
Total Indian Cotton ..	704	323	847	94	1,968
Total exports, as per official returns, from British Indian and Kathiawar Ports—Bales of 400 lbs. net	789	362	813	136	2,100

* Standard Indian bales of approximate average gross weight 400 lbs, and net weight 392 lbs. of cleaned (lint) cotton.

APPENDIX

RECEIPTS AT MILLS IN INDIA OF

(Compiled from Voluntary Returns

1st September 1937 *to*

(In thousand bales*

Trade Descriptions of Cotton.	Bombay Island.	Ahmedabad.	Rest of Bombay Presidency.	Total Bombay Presidency.	Madras Presidency.	United Provinces.	C. P. & Berar.	Bengal.	Punjab and Delhi.	Rest of British India.
BENGALS—										
United Provinces	11	—	—	11	—	111	—	5	7	—
Punjab	24	1	1	26	—	43	—	6	56	9
Sind	5	2	—	7	—	—	—	—	—	—
Rajputana	11	1	—	12	1	—	—	—	—	29
Others	7	—	—	7	—	8	—	—	—	—
Total ..	58	4	1	63	1	162	—	11	63	38
OOMRAS—										
Central Provinces Oomras	15	1	9	25	—	3	102	7	—	—
Berar Oomras	20	1	6	27	—	—	56	3	—	—
Khandesh—Banilla	10	—	15	25	—	—	—	—	—	—
Khandesh—Oomras	15	—	22	37	1	—	—	—	—	—
Central India—Malvi	4	2	2	8	—	8	—	—	—	—
Central India—Others	12	3	4	19	—	8	—	—	—	—
Barsi and Nagar Oomras	21	—	39	60	—	—	—	—	—	—
Total ..	97	7	97	201	1	19	158	10	—	—
VERUM	2	1	13	16	—	—	20	—	—	—
HYDERABAD GAORANI	26	1	44	71	2	—	19	—	—	—
Total ..	28	2	57	87	2	—	39	—	—	—
AMERICANS—										
Punjab—289-F	77	17	4	98	10	41	1	7	2	—
Punjab L. S. S.	32	6	—	38	1	12	—	4	15	—
Punjab (Unspecified—4-F)	118	12	4	134	18	183	2	39	62	8
Sind-Sudhar (289-F-1)	28	4	1	33	—	—	—	1	—	—
Sind (Unspecified & 4-F-98) ..	80	7	2	89	27	1	—	1	—	—
Dharwar (Gadag 1)	9	—	3	12	—	—	—	—	—	—
Dharwar (Upland—Unspecified) ..	3	—	8	11	5	—	—	—	—	—
Cambodia (Coimbatore No. 2) ..	3	—	—	3	128	—	—	—	—	—
Cambodia (Unspecified)	3	—	1	4	63	—	1	3	—	—
Total ..	353	46	23	422	252	237	4	55	79	8
BROACH—										
Surat-Navsari (Surti)	57	74	8	139	6	—	2	1	—	—
Broach (Unspecified)	146	67	8	221	5	—	2	5	—	3
Total ..	203	141	16	360	11	—	4	6	—	3
DHOLLERAS—										
Mattheo	17	3	—	20	—	—	—	—	—	—
Cutch	—	—	1	1	—	—	—	—	—	—
Wagad	10	96	3	109	—	—	—	—	—	—
Dholleras (Unspecified)	9	9	2	20	—	—	—	—	—	—
Total ..	36	108	6	150	—	—	—	—	—	—
SOUTHERNS—										
Kumptas (Jayawant)	30	1	3	34	10	—	—	—	—	—
Kumptas (Unspecified)	25	2	22	49	1	—	—	—	—	—
Westerns (Jowari and Mungari) ..	27	1	43	71	13	1	—	—	—	—
Northerns	4	—	1	5	3	—	—	—	—	—
Coconadas (and Warangal)	1	—	2	3	3	—	—	2	—	—
Karunganni	1	—	—	1	48	—	—	—	—	—
Tinnevellies	1	—	1	2	64	—	—	6	—	—
Salems	2	—	—	2	10	—	—	—	—	—
Total ..	91	4	72	167	152	1	—	8	—	—
COMILLAS	—	—	—	—	—	—	—	—	—	—
OTHER SORTS	1	—	1	2	4	—	—	—	—	—
Total Indian Cotton ..	867	312	273	1,452	423	419	205	90	142	49
AMERICANS	113	7	4	124	2	—	—	3	—	—
EGYPTIANS	32	69	1	102	9	—	2	2	1	—
EAST AFRICANS	94	111	17	222	7	—	2	12	3	—
OTHERS (Sudan, Mesopotamia, etc.)	39	22	2	63	6	—	—	4	—	—
Total Foreign Cotton ..	278	209	24	511	24		4	21	4	—
GRAND TOTAL	1,145	521	297	1,963	447	419	209	111	146	49
Indian raw cotton consumed in mills in India. (Figures compiled mainly from returns under the Indian Cotton Cess Act—Bales of 400 lbs. net.)	783	346	225	1,354	418	288	146	92	95	47

* Standard Indian bales of approximate average gross

IX

RAW COTTON CLASSIFIED BY VARIETIES.

furnished by Mills.)

31*st August* 1938.

of 400 lbs. each.)

Total British India.	Hyderabad.	Mysore.	Baroda.	Gwalior.	Indore.	Kathiawar States.	Other Indian States.	Pondicherry.	Total Indian States.	GRAND TOTAL.	Trade Descriptions of Cotton.
											BENGALS—
134	—	—	—	7	—	—	1	—	8	142	United Provinces
140	—	1	1	4	—	—	4	—	10	150	Punjab
7	—	—	—	—	—	—	—	—	—	7	Sind
42	—	1	—	13	—	—	3	—	17	59	Rajputana
15	—	—	—	—	—	—	1	—	1	16	Others
338	—	2	1	24	—	—	9	—	36	374	Total
											OOMRAS—
137	—	1	—	1	—	—	1	1	4	141	Central Provinces Oomras
86	—	2	2	—	—	—	—	—	4	90	Berar Oomras
25	—	—	—	—	—	—	—	—	—	25	Khandesh—Banilla
38	—	—	—	—	—	—	—	—	—	38	Khandesh—Oomras
16	—	—	3	36	45	—	7	—	91	107	Central India—Malvi
27	—	1	3	—	44	—	3	—	51	78	Central India—Others
60	3	—	—	—	—	—	—	—	3	63	Barsi and Nagar Oomras
389	3	4	8	37	89	—	11	1	153	542	Total
36	—	—	1	1	5	—	—	—	7	43	VERUM
92	69	—	—	1	—	—	—	—	70	162	HYDERABAD GAORANI
128	69	—	1	2	5	—	—	—	77	205	Total
											AMERICANS—
159	—	1	1	—	1	—	6	1	10	169	Punjab—289-F
70	—	—	—	2	—	—	1	1	4	74	Punjab L. S. S.
446	—	1	2	29	5	—	6	2	45	491	Punjab (Unspecified—4-F)
34	—	—	—	—	—	—	—	—	—	34	Sind-Sudhar (289-F-1)
118	—	1	—	—	—	2	6	10	19	137	Sind (Unspecified and 4-F-98)
12	—	1	—	—	—	—	—	—	1	13	Dharwar (Gadag 1)
16	—	1	—	2	—	—	—	—	3	19	Dharwar (Upland —Unspecified)
131	—	2	—	—	—	—	1	—	3	134	Cambodia ((Coimbatore No. 2)
71	—	1	—	—	—	—	3	—	4	75	Cambodia (Unspecified)
1,057	—	8	3	33	6	2	23	14	89	1,146	Total
											BROACH—
148	—	—	14	1	2	7	1	2	27	175	Surat-Navsari (Surti)
236	—	—	16	—	1	6	1	1	25	261	Broach (Unspecified)
384	—	—	30	1	3	13	2	3	52	436	Total
											DHOLLERAS—
20	—	—	—	—	—	8	—	—	8	28	Mattheo
1	—	—	—	—	—	—	—	—	—	1	Cutch
109	—	—	25	—	—	24	1	—	50	159	Wagad
20	—	—	4	—	—	—	—	—	4	24	Dholleras (Unspecified)
150	—	—	29	—	—	32	1	—	62	212	Total
											SOUTHERNS—
44	—	8	—	—	—	—	—	—	8	52	Kumptas (Jayawant)
50	—	18	—	—	—	—	9	—	27	77	Kumptas (Unspecified)
85	3	25	—	—	—	—	—	1	29	114	Westerns (Jowari and Mungari)
8	—	1	—	—	—	—	—	1	2	10	Northerns
8	8	—	—	—	—	—	1	1	10	18	Coconadas (and Warangal)
49	—	—	2	—	—	—	—	—	2	51	Karunganni
72	—	—	1	—	—	—	—	—	1	73	Tinnevellies
12	—	—	—	—	—	—	—	—	—	12	Salems
328	11	52	3	—	—	—	10	3	79	407	Total
—	—	—	—	—	—	—	—	—	—	—	COMILLAS
6	—	2	—	—	—	—	—	—	2	8	OTHER SORTS
2,780	83	68	75	97	103	47	56	21	550	3,330	Total Indian Cotton
129	—	—	—	1	—	—	—	—	1	130	AMERICANS
116	—	1	8	—	—	—	—	—	9	125	EGYPTIANS
246	—	2	22	—	1	4	—	—	29	275	EAST AFRICANS
73	—	—	2	—	—	—	1	—	3	76	OTHERS (Sudan, Mesopotamia, etc.)
564	—	3	32	1	1	4	1	—	42	606	Total Foreign Cotton
3,344	83	71	107	98	104	51	57	21	592	3,936	GRAND TOTAL
2,440	63	55	71	89	148	49	57	22	554	2,994	Indian raw cotton consumed in mills in India. (Figures compiled mainly from returns under the Indian Cotton Cess Act—Bales of 400 lbs. net.)

eight 400 lbs. and net weight 392 lbs. of cleaned (lint) cotton.

APPENDIX X.

Rules under the Central Provinces Cotton Control Act.

NOTIFICATION.

Nagpur, the 30th May 1938.

No. 938-235-*X.*—In exercise of the powers conferred by section 11 of the Central Provinces Cotton Control Act, 1937 (C.P. Act XX of 1937), and of the same Act as applied to Berar, the Provincial Government is pleased to make the following rules to carry into effect the purposes of the said Act :—

RULES.

1. No one shall possess, use or sell Garrowhill cotton, cotton mixed with Garrowhill cotton or possess or sell Garrowhill cotton seed for the purpose of cultivation with effect from the 1st June 1938. This rule shall remain in operation so long as the prohibition in respect of the cultivation of Garrowhill cotton or mixing of such cotton with any other kind of cotton shall remain in force.

2. The report required to be made under clause (*a*) of sub-section (2) of section 5 of the Act shall be in Form A or Form B annexed to these rules, according as the cotton to which the report relates was seized under clause (*a*) or (*b*) of sub-section (1) of section 5.

3. Every officer seizing any cotton under sub-section (1) of section 5 shall forward to the officer authorized under clause (*b*) of sub-section (2) of that section—

(*a*) 10 lbs. of the cotton seized, if such cotton weighs more than 10 lbs. ; or

(*b*) all the cotton seized, if such cotton weighs less than 10 lbs.

4. A notice under sub-section (1) of section 5 shall be given in Forms C and D.

FORM A.

REPORT OF THE SEIZURE OF COTTON UNDER CLAUSE (*a*) OF SUB-SECTION (1) OF SECTION 5 OF THE ACT.

(1) Description of the land in which the Garrowhill cotton is found cultivated at the time of seizure—

(*a*) District—

(*b*) Taluq/tahsil—

(*c*) Village—

(*d*) (*i*) Survey number/khasra number of the field in question—

(*ii*) sub-division number, if any—

(2) (*i*) Name of the recorded owner or occupier of the land—

(*ii*) Name of the person who cultivated Garrowhill cotton—

(3) Particulars of the cotton seized—

(*i*) Description—

(*ii*) Quantity—

(4) Remarks—

Station..... Signature of the Reporting Officer.

Dated.....19

FORM B.

REPORT OF THE SEIZURE OF COTTON UNDER CLAUSE (*b*) OF SUB-SECTION (1) OF SECTION 5 OF THE ACT.

(1) Description of the land, building, vessel or place in which Garrowhill cotton or cotton mixed with Garrowhill cotton was kept—

(*a*) District—

(*b*) Taluq/tahsil—

(*c*) Village—

(*d*) (*i*) Survey number/khasra number—
(*ii*) Sub-division number, if any—

(2) (*i*) Name of the recorded owner or occupier of the land, building, vessel or place—
(*ii*) Name of the person who cultivated or owns the Garrowhill cotton—

(3) Name of the person from whose possession the cotton was seized—

(4) Particulars of cotton seized—

(*a*) Description—

(*b*) Quantity—

(5) Any other remarks—

Station..... Signature of the Reporting Officer.

Dated.....19

Copy forwarded to the Deputy Commissioner, ... for information.

FORM C.

[NOTICE UNDER SECTION 5(1).]

To

.....

.....

.....

It is suspected that Garrowhill cotton or mixture of such cotton with some other cotton is being cultivated in the land or field/has been kept

on the land or in the building or place, described below in contravention of the Agriculture Department Notification No. 935-235-X, dated the 30th May 1938, issued under section 3 of the Central Provinces Cotton Control Act, 1937 (C.P. Act XX of 1937), and of the same Act, as applied to Berar. You are, therefore, hereby required to take notice, under clause (*a*)/clause (*b*) of sub-section (1) of section 5 of the said Act, that the undersigned proposes to enter upon or into the said land, field, building or place by the*.....

Description of land, etc.

* * * *

Deputy Director of Agriculture.
Extra-Assistant Director of Agriculture.
Agricultural Assistant.

Dated..... 19

*Date and time to be mentioned here.

FORM D.

[NOTICE UNDER SECTION 5(1) (*a*).]

To

.....

.....

.....

It has come to my notice (or it is suspected) that Garrowhill cotton or mixture of such cotton with some other cotton is being cultivated in your land or field described below in contravention of the Agriculture Department Notification No. 935-235-X, dated the 30th May 1938, issued under section 3 of the Central Provinces Cotton Control Act, 1937 (C. P. Act XX of 1937), and of the same Act, as applied to Berar. You are, therefore, hereby directed to uproot the same or cause it to be uprooted within..... days from the day of the receipt of this notice.

Description of land or field.

* * * *

Deputy Director of Agriculture.
Extra-Assistant Director of Agriculture.
Agricultural Assistant.

Dated 19

By order of the Governor,
Central Provinces & Berar,

C. J. W. LILLIE,
Secretary to Government, C.P. & Berar,
Agriculture Department.

NOTIFICATION.

Nagpur, the 30th May 1938.

No. 937-235-*X.*—In exercise of the powers conferred by clause (*b*) of sub-section (2) of section 5 of the Central Provinces Cotton Control Act, 1937 (C. P. Act XX of 1937), and of the same Act as applied to Berar, the Provincial Government is pleased to authorize the Economic Botanist for Cotton, Central Provinces, to receive cotton seized under sub-section (1) of that section for examination and report the result to the Director of Agriculture, Central Provinces and Berar, and also to the Deputy Commissioner of the district concerned.

By order of the Governor,
Central Provinces & Berar,

C. J. W. LILLIE,
Secretary to Government, C.P. & Berar,
Agriculture Department.

NOTIFICATION.

Nagpur, the 30th May 1938.

No. 936-235-*X.*—In exercise of the powers conferred by sub-section (1) of section 5 of the Central Provinces Cotton Control Act, 1937 (C.P. Act. XX of 1937), and of the same Act as applied to Berar, the Provincial Government is pleased to authorize all Deputy Directors of Agriculture and all Extra-Assistant Directors of Agriculture and Agricultural Assistants to exercise the powers specified in that section within their jurisdiction.

By order of the Governor,
Central Provinces & Berar,

C. J. W. LILLIE,

Secretary to Government, C.P. & Berar, Agriculture Department.

NOTIFICATION.

NAGPUR, *the 30th May* 1938.

No. 935—235-*X.*—In exercise of the powers conferred by section 3 of the Central Provinces Cotton Control Act, 1937 (C. P. Act XX of 1937), and of the same Act as applied to Berar, the Provincial Government is pleased to prohibit for a period of five years in the districts of Nagpur, Wardha, Amraoti, Yeotmal, Buldana, Akola and Nimar, and the Sausar tahsil of district Chhindwara :—

(*a*) the cultivation of Garrowhill cotton ;

(*b*) the mixing of Garrowhill cotton with any other kind of cotton ;

Provided that nothing contained in this notification shall be deemed to prohibit the Economic Botanist for cotton, Central Provinces, from cultivating Garrowhill for experimental purposes at the cotton breeding stations or Government farms and possessing or using the cotton so cultivated or mixing the same with any other type of cotton, or possessing or using such admixture.

By order of the Governor,
Central Provinces & Berar,

C. J. W. LILLIE,

Secretary to Government, C. P. & Berar, Agricultural Department.

APPENDIX XI.

Bhopal Cotton Control Act.

ACT No. XVI OF 1936.

(PASSED BY THE BHOPAL LEGISLATURE.)

Received the assent of His Highness the Ruler on the 10th April 1937.

An Act to provide for the prohibition and control of inferior cotton in the Bhopal State.

Preamble.—WHEREAS it is expedient, in the interests of the growers of cotton, the cotton trade and economic prosperity, to maintain and safeguard the quality and reputation of the cotton grown in the Bhopal State and, for that purpose, to encourage the cultivation of superior cotton, and to prohibit or restrict the cultivation, possession or use of inferior cotton ; It is hereby enacted as follows :—

1. *Short title and extent.*—(1) This Act may be called the " Bhopal State Cotton Control Act, 1936. "

(2) The Government may, by notification in its official *Gazette*, extend all or any of the provisions of this Act to the whole or to certain parts of the Bhopal State, and prescribe a date on which it shall come into force.

2. *Definitions.*—In this Act, unless there is anything repugnant in the subject or context,—

(*a*) " Cotton " includes cotton plant, ginned or unginned cotton, cotton waste and cotton seed ;

(*b*) " Director of Agriculture " means the officer appointed for the time being to be the Director of Agriculture ;

(*c*) " Prohibited cotton " means and includes any variety of cotton which the Government may, by notification published in its official *Gazette*, from time to time declare to be prohibited ;

(*d*) " Controlled area " means an area specified in a notification published under section 3.

3. *Power to issue notification prohibiting the cultivation, etc., of a particular variety of cotton.*—The Government may, by notification published in its official *Gazette*, either in the whole of the Bhopal State, or on such local area thereof, and for such periods of time, as may be specified in such notification, prohibit or restrict :—

(*a*) the cultivation of prohibited cotton ; or

(*b*) the mixture of any two or more varieties of cotton ; or

(*c*) the possession of, or trade, in, prohibited cotton, or the mixture of any two or more varieties of cotton.

4. *Penalty.*—Any person who, in contravention of the provisions of this Act or of any notification published under section 3 or rule made under section 14 :—

(*a*) cultivates or attempts to cultivate prohibited cotton shall, on conviction, be punishable with fine which may extend to rupees five for every first offence and to rupees ten for every subsequent offence ;

(*b*) (i) mixes or attempts to mix any two or more varieties of cotton, or

(ii) posse-ses or trades in, or attempts to possess or trade in prohibited cotton, or mixture of any two or more varieties of cotton,

shall, on conviction, be punishable with fine which may extend to rupees twenty-five for every first offence and to rupees fifty for every subsequent offence.

5. *Forfeiture.*—Whenever an offence under this Act has been committed, all cotton in respect of which such offence has been committed and every box, receptacle, package or covering in which such cotton is contained may be liable to be forfeited to Government.

6. *Procedure in forfeiture.*—(1) When in any case tried by a Court, the Court decides that anything is liable to forfeiture under section 5, it may, after hearing the person, if any, claiming any right thereto, and the evidence, if any, which may be produced in support of his claim, order forfeiture.

(2) When an offence under this Act has been committed and the offender is not known or cannot be found, or when any article liable to forfeiture under this Act is found and is not claimed by any person, the officer authorised by the Government in this behalf may hold an inquiry and may order forfeiture of such article :

Provided that no such order shall be made before the expiry of one month from the date of seizing the article liable to forfeiture or without hearing the person, if any, claiming any right thereto and the evidence, if any, which may be produced in support of his claim.

7. *Compounding.*—(1) The officer authorised under sub-section (2) of section 6 may accept from any person who is reasonably suspected of having committed an offence under section 4, such sum of money as may be prescribed by rules made under section 14, by way of compounding such offence.

(2) On payment of such sum by such person, the proceedings, if any, instituted in a Court, shall terminate, and no further action shall be taken in respect of the offence committed.

(3) Notwithstanding anything contained in sub-section (2), it shall be lawful for the Court or the officer authorised under sub-section (2) of section 6 to order forfeiture of any article under section 5.

8. *Power of entry and seizure.*—(1) Any officer authorised in this behalf by the Government may, between the hours of sunrise and sunset :—

(*a*) enter upon any land in a controlled area in which he knows or has reason to believe that prohibited cotton has been or is being cultivated in contravention of a notification published under section 3, uproot or cause to be uprooted such cotton, and seize the cotton so uprooted ; or

(*b*) enter upon or into any land, building, vessel, vehicle or place in a controlled area in which he knows or has reason to believe that prohibited cotton, or mixture of any two or more varieties of cotton, is kept in contravention of a notification published under section 3, and seize such cotton ;

Provided always that, whilst such cotton is in transit within the confines of the Bhopal State, either by land or by water, such officer may seize it at any time of the day or night.

(2) Every officer seizing any cotton under this section shall forthwith :

(*a*) make a report of such seizure to the nearest Magistrate of the First or Second Class having jurisdiction to try the offence committed in respect of such cotton, specifying in such report the particulars of such cotton, and furnish a copy of such particulars to the occupier, or person in charge, of the land, building, vessel, vehicle or place on or in which such seizure was made, and

(*b*) subject to rules made under section 14, forward such cotton to the nearest officer authorised by the Government to receive it, for examination and for report to the Director of Agriculture.

(3) The opinion of the officer authorised under sub-section (2) regarding such cotton recorded in any document signed by such officer shall be evidence of the nature of such cotton in any inquiry, trial or proceeding under this Act.

9. *Duty of owner, occupier and person in charge to give facilities for inspection by authorised officer.*—(1) Every owner, occupier or person in charge of any land, building, vessel, vehicle or place shall give all reasonable facilities to the officer authorised under sub-section (1) of section 8, to inspect such land, building, vessel, vehicle or place.

(2) Any person who contravenes the provisions of sub-section (1) shall, on conviction, be punishable with fine which may extend to rupees ten.

10. *Previous sanction and limitation for prosecution.*—No prosecution under this Act shall be instituted without the previous sanction of the Director of Agriculture.

11. *Cognizance of offences.*—No Court inferior to that of a Magistrate of the Second class shall try any offence under this Act.

12. *Protection for acts done under the Act.*—No suit, prosecution or other legal proceeding shall be instituted against any person for anything which is in good faith done or intended to be done under this Act.

13. *Officer acting under the Act to be public servant.*—Every officer acting or purporting to act in pursuance of the provisions of this Act shall be deemed to be a public servant within the meaning of section 17 of the Bhopal State Penal Code.

14. (1) The Government may make rules not inconsistent with the provisions of this Act for the purpose of carrying into effect the purposes of this Act.

(2) In particular and without prejudice to the generality of the foregoing provisions, the Government may make rules for all or any of the following purposes, namely :—

(*a*) to prescribe the sum of money to be paid by way of compounding under section 7 ;

(*b*) to prescribe the conditions subject to which cotton seized may be forwarded under section 8 ;

(c) any other matter which may in the opinion of the Government have to be provided for.

(3) Any such rule may provide that a contravention thereof shall be punishable with fine which may extend to rupees twenty.

(4) The rules made under this section shall, for their enforcement, be subject to previous publication in the *Bhopal Government Gazette.*

APPENDIX XII.

A Bill to amend the Cotton Ginning and Pressing Factories Act, 1925, in its application to the Province of Bombay.

XII of 1925.—WHEREAS it is expedient to amend the Cotton Ginning and Pressing Factories Act, 1925, in its application to the Province of Bombay, for the purposes hereinafter appearing; It is hereby enacted as follows :—

1. *Short title.*—This Act may be called the Cotton Ginning and Pressing Factories (Bombay Amendment) Act, 1938.

2. *Amendment of section 3A of Act XII of* 1925.—In Section 3A of the Cotton Ginning and Pressing Factories Act, 1925, hereinafter called the said Act :—

(1) in clause (*a*) of sub-section (2) after the words " foreign substance," the words " or cotton waste " shall be inserted,

(2) sub-section (3) shall be deleted.

3. *Insertion of new section 3AA in Act XII of* 1925.—After section 3A of the said Act, the following new section shall be inserted :—

" 3AA. *Penalty for making any cotton wet.*—Any owner of cotton who knowingly makes or causes to be made any cotton which is ginned and which is being or is intended to be pressed in a cotton pressing factory, wet, or mixes or causes to be mixed seed, foreign substance or cotton waste with such cotton, or in any area specified in sub-section (1) of section 3A makes any admixture of cotton, or abets or knowingly allows or connives at any such act shall, on conviction, be punishable with fine which may extend to five thousand rupees."

4. *Amendment of section 3B of Act XII of* 1925.—In section 3B of the said Act, after the word, figure and letter " section 3A," the words, figure and letters " or section 3AA " shall be inserted.

STATEMENT OF OBJECTS AND REASONS.

Doubts have arisen whether under the Cotton Ginning and Pressing Factories Act, 1925, as amended by Bombay Act IV of 1936, the mixing of cotton waste with cotton is an offence. It is possible to remove these doubts by specifying cotton waste as a substance which, like other foreign substances, must not be mixed with cotton.

Doubts are also entertained whether in view of the scheme of section 3A of the Act, the deliberate watering of cotton is an offence when the watering is so regulated as not to cause the water contents of the cotton to exceed the limit prescribed for determining whether cotton has been watered. It is, therefore, proposed to split up section 3A into two sections, 3A and 3AA, the latter of which deals solely with the deliberate watering of cotton, which is made an offence in all circumstances.

APPENDIX XIII.

Cotton Ginning and Pressing Factories (Madras Amending) Bill 193 .

A Bill to amend the Cotton Ginning and Pressing Factories Act, 1925, in its application to the Province of Madras.

XII of 1925

5 and 6 Geo. V. 961.

Preamble.—Whereas it is expedient to amend the Cotton Ginning and Pressing Factories Act, 1925, in its application to the Province of Madras, for the purposes hereinafter appearing; and whereas the previous sanction of the Governor-General required under sub-section (3) of section 80A and the previous sanction of the Governor required under section 80C of the Government of India Act have been obtained for the passing of this Act, it is hereby enacted as follows :—

1. *Short title, extent and commencement.*—(1) This Act may be called the Cotton Ginning and Pressing Factories (Madras Amendment) Act, 193 .

(2) This Act shall extend to such areas in the said Province with effect from such date or dates as the Provincial Government may, by notification in the *Fort St. George Gazette* appoint on this behalf.

2. *XII of* 1925. *Amendment of section* 2 *of Act XII of* 1925.—In section 2 of the Cotton Ginning and Pressing Factories Act, 1925, hereinafter called the said Act,

(1) after the word, comma and dash " context,— " the following shall be inserted, namely :—

(*aa*) ' admixture of cotton ' means mixture of different varieties of cotton mentioned in the prescribed schedule.

(2) after the words ' unginned cotton ' in clause (*b*) the comma shall be deleted and a semicolon shall be inserted. The words ' or cotton waste ; ' shall be deleted.

(3) after clause (*c*), the following shall be inserted namely :—

(*cc*) " Foreign substance " means substance other than cotton lint but does not include cotton leaf or seed below the prescribed limit.

(4) after clause (*f*) the following clause shall be inserted, namely :—

(*ff*) ' license ' means a license granted under section 2A.

(5) The existing clause (*g*) shall be deleted and the following clause shall be substituted :—

(*g*) ' owner ' includes occupier or managing agent or person authorised to represent owner or occupier.

3. *Insertion of section 2A in Act XII of* 1925.—After section 2 of the said Act, the following section shall be inserted, namely :—

" 2A. *Licence for working cotton ginning factory or cotton pressing factory.*—(1) No cotton ginning factory or cotton pressing factory shall be worked without a licence granted to the owner thereof by such authority, in such form, subject to such conditions and on payment of such fee, as may be prescribed.

(2) No licence for which the prescribed fee has been paid shall be refused except on the ground that the owner of a cotton ginning or pressing factory in respect of which the licence is applied for, has been convicted of an offence punishable under this Act, and no licence shall be suspended, withdrawn, or cancelled unless the owner of the cotton ginning or pressing factory in respect of which the licence was granted, has been convicted for an offence punishable under this Act.

(3) If any person works a cotton ginning or cotton pressing factory in respect of which a licence has not been granted or has been suspended, withdrawn or cancelled, such person shall on conviction, be punishable with fine which may extend to five hundred rupees or, if he has been previously convicted of any offence under this sub-section, to fifteen hundred rupees."

4. *Insertion of new sections 3A, 3B and 3C in Act XII of* 1925.—After section 3 of the said Act the following new sections shall be inserted namely :—

"3A. (1) The Provincial Government may by notification in the *Fort St. George Gazette* declare that in any area specified in such notification and to which this Act has been extended, no cotton which is ginned or pressed in a cotton ginning or cotton pressing factory shall contain any admixture of cotton without specifying the fact conspicuously on the outside of the bale or borah in the prescribed manner. Every bale or borah of cotton not bearing the mark ' mixed ' shall be considered as containing pure cotton. The local spinning mills, however, may mix in any way necessary to their industry, provided that the mixing takes place in the gins or presses installed in the mill premises and that when such bales or borahs are for sale, they are to be labelled clearly on the outside as ' mixed.'

(2) Any owner of a cotton ginning or cotton pressing factory or any person in charge of such factory,

(*a*) who knowing or having reason to believe that any cotton is watered, or contains seeds in excess of the prescribed proportion or contains cotton waste or any foreign substance, gins or presses or allows such cotton to be ginned or pressed in such factory, or

(*b*) who, in any area, specified in the notification under sub-section (1) fails to mark on the outside of any cotton package or borah or bale which he knows or has reason to believe to contain an admixture of cotton, as ' mixed ',"

shall on conviction be punishable with fine which may extend to fifteen hundred rupees.

(3) Any owner of cotton who knowingly waters any cotton which is being or is intended to be ginned and which is being or is intended to be pressed in a cotton pressing factory or mixes seed or cotton waste or foreign substance with such cotton or in any area specified in sub-section (1) makes any admixture of cotton, or abets, or knowingly allows or connives at any such watering, or mixing with seed or cotton waste or foreign substance or admixture of cotton, shall, on conviction, be punishable with fine which may extend to fifteen hundred rupees.

Explanation.—For the purposes of this section cotton shall not be deemed to be watered or mixed with seed or leaf unless such cotton contains moisture or seed or leaf in excess of the normal quantity. The normal quantity of moisture in any given quantity of cotton is the amount of moisture that such cotton is reasonably expected to have, regard being had to the place or places at or to which, and the time or times of the year in which, such cotton has been picked, collected, stored, conveyed, ginned or pressed. The normal quantity of seed or leaf in any given quantity of cotton is the amount of seed or leaf that such cotton is reasonably expected to have regard being had to the variety of cotton. A certificate given by the prescribed authority as to the normal quantity of moisture or seed or leaf that a given quantity of such cotton should have, and the quantity of moisture or seed or leaf that it possesses shall be evidence of such matters, until the contrary is proved ; and if the latter quantity exceeds the former it shall be evidence, until the contrary is proved, that the cotton is watered or mixed with seed or leaf.

"3B. *Examination of cotton packages or bales.*—(1) The Provincial Government or any officer authorised by it in this behalf may on its or his own motion or on receipt of a complaint that there has been a contravention of the provisions of section 3-A in respect of any cotton, package or of any cotton bale and in the case of a complaint, on payment of the prescribed fee by the complainant, cause such cotton or the contents of such package or bale to be examined by the prescribed person or body.

(2) A certificate given by such person after examination of such cotton or the contents of such cotton package or bale under—sub-section (1) shall be admissible in evidence and be presumptive proof of the facts mentioned therein until the contrary is proved.

3C. *Entry and inspection.*—(1) The Provincial Government may authorise any officer to enter into and inspect, at any reasonable time, any cotton ginning or cotton pressing factory for the purpose of ascertaining whether there is any contravention therein of any of the provisions of this Act or of any rule made thereunder or of any of the conditions subject to which a licence has been granted in respect of such factory and to seize all things in respect of which an offence punishable under this Act appears to have been committed.

(2) The owner of every cotton ginning or cotton pressing factory shall give every reasonable assistance to the inspecting officer in the performance of his duties under sub-section (1).

(3) The owner of such factory shall in every instance, be permitted to attend during the inspection and the things seized during such inspection shall be sealed in the prescribed manner."

5. *Amendment of section 5 of Act XII of* 1925.—For section 5 of the said Act, the following section shall be substituted, namely :—

Returns.—" (1) The owner of every cotton ginning factory shall submit to the prescribed authority, within such time and in such form, as may be prescribed, a return showing the quantity of cotton ginned in the factory during the ginning year.

(2) The owner of every cotton pressing factory shall submit to the prescribed authority, within such time and in such form, as may be prescribed weekly returns showing the total number of bales of cotton pressed during the preceding week and from the commencement of the season to the end of that week, and the approximate average net weight of the bales pressed in that week.

(3) The Provincial Government shall compile from the weekly returns submitted under sub-section (2), and shall publish in such manner as the Provincial Government may direct, a statement showing the total number of bales pressed in the province during the week and from the commencement of the season to the end of the week to which the returns relate : provided that the number of bales pressed in any individual factory shall not be published.

(4) If default is made in submitting any return as required by sub-section (1) or sub-section (2), the owner of the factory shall, on conviction, be punishable with fine which may extend to fifty rupees.

(5) Where the owner of a cotton ginning or cotton pressing factory has notified to the prescribed authority that the work of ginning cotton or pressing bales in that factory has been suspended, it shall not be necessary for the owner to submit returns under sub-section (1) or sub-section (2) until such work has been resumed.

Explanation.—In this section ' season ' means the periods notified in this behalf by the Provincial Government in local official *Gazette.*"

5*A*. *Amendment of Section 6 Scales and Weights.*—In sub-section (1) and (2) of Section 6 of the Act, after the word " used," insert the words " or kept."

6. *Amendment of section 7 of Act XII of* 1925.—In sub-section (1) of section 7 of the said Act, after the words " for the purpose of section 3 " insert the figures and letters " 3A, 3B, 3C."

7. *Insertion of a new clause to section* 9 (1) *of Act XII of* 1925.—The following clause shall be inserted as (c) after sub-section (1) b of section 9 :—

' A kapas opener shall be installed in every ginning factory and worked to free the kapas prior to ginning, from foreign substances.'

8. *Amendment of section* 9 (1) *of Act XII of* 1925.—In section 9 (1) of the said Act, after the words ' provided that nothing in ' insert the words ' the clauses (a) and (b) of.'

9. *Amendment of section* 9 (4) *b of Act XII of* 1925.—The words, ' and on the occupier if any ' occurring in line 4 ' and the occupier if any ' in line 9 and ' jointly and severally ' in line 10 of section 9 (4) b shall be deleted.

10. *Amendment of section* 13 *of Act XII of* 1925.—In section 13 of the said Act, after clause (a), the following clauses shall be inserted, namely :—

" (*aa*) preparation of a schedule on the varieties of cotton for the purposes of section 2 (aa) ;

(*ab*) power to postpone the application of rules or exempt any local area from their operation ;

(*ac*) the authority by whom the form in which, the conditions subject to which and the fees on payment of which, licence may be granted under sub-section (1) of section 2A ;

(*ad*) the manner of marking the borah or bale containing admixture of cottons specified in section 3A (1).

(*ae*) the proportion of seed and leaf which may be contained in cotton ;

(*af*) the person authorised to give a certificate regarding quantity of moisture, of seed, or leaf contained in any cotton and other matters specified in section 3A ;

(*ag*) the person authorised to examine packages or bales under section 3-B ;

(*ah*) the procedure for making a complaint and causing the contents of a package or bale to be examined and the fee for examination of the contents of a package or bale under sub-section (1) of section 3-B ;

(*ai*) the manner in which the things seized shall be sealed under section 3-C."

11. *Addition of sections* 16 *and* 17 *in Act XII of* 1925.—After section 15 of the said Act, the following sections shall be added, namely :—

16. " Whoever contravenes any of the provisions of this Act or any rule made thereunder or any of the conditions subject to which a licence has been granted to him shall, on conviction, if no other penalty is already provided in this Act for such contravention, be punishable with fine which may extend to five hundred rupees or, if he has previously been convicted of an offence under this Act or any rule made thereunder, with fine which may extend to fifteen hundred rupees.

17. *Compounding offences, etc.*—(1) The officer authorised by the Provincial Government in this behalf may accept from any person whose licence is liable to be suspended, withdrawn or cancelled under this Act, or who is reasonably suspected of having committed an offence under this Act, a sum of money in lieu of such suspension, withdrawal or cancellation or by way of composition for the offence which may have been committed, as the case may be.

(2) On payment by such person of such sum to such officer, such person if in custody shall be set at liberty and if criminal proceedings shall have been instituted against such person, the composition shall be held to amount to an acquittal."

12. *Amendment of sections* 3, 4, 6, 7, 8 *and* 9 *of Act XII of* 1925.—In sub-sections (5 and (6) of section 3 in sub-section (2) of section 4, in sub-section (2) of section 6, in sub-section (3) of section 7, in sub-section (2) of section 8, and in sub-section (3) of section 9 of the said Act for the words " shall be punished " the words " shall, on conviction, be punishable " shall be substituted.

Statement of Objects and Reasons.

The Cotton Ginning and Pressing Factories Act, 1925, was passed for the purpose of providing for the maintenance of registers by both kinds of factories and the submission of returns by the owners of pressing factories. These provisions serve statistical purposes but are not sufficient for the maintenance of the quality cotton and for the prevention of certain malpractices which are prevalent in ginning and pressing factories. Some of the malpractices which require to be stopped if the superiority of certain varieties as well as the purity of improved grades of cotton are to be maintained and the cotton grower is to get an adequate price for superior cottons are :—(1) watering of cotton, (2) mixing of different varieties of cotton, (3) false packing, (4) non-removal of foreign substances; in consequence of these malpractices the reputation of superior cottons has suffered considerably and it has been from time to time suggested to Government that they should take steps to check them. It has, therefore, been suggested that cotton ginning and pressing factories should be licensed and the ginning and pressing of cotton which has been watered or mixed should be prohibited. Opportunity has now been taken to include the insistence of installation of kapas openers in all ginneries irrespective of their age and size and thus resuscitate a good practice which has fallen into disuse simply on account of competition amongst ginnery owners. Further it is often found that more than one set of weights or scales are kept in cotton ginning and pressing factories. Some of these fail to comply with the requirements imposed by the rules. The keeping of such faulty scales and weights in the factories gives room to suspect their fraudulent use. It is now suggested that the retention or possession of such scales and weights within the premises of the factories should be made penal with a view to prevent the perpetration of fraud of the above type. The object of this Bill is to give effect to these suggestions.

APPENDIX XIV.

Punjab Agricultural Produce Markets Bill.

(BILL No. 19 of 1938).

(BILL AS INTRODUCED IN THE ASSEMBLY ON THE 7TH JULY, 1938.)

A Bill to provide for the better regulation of the purchase and sale of agricultural produce and the establishment of markets for agricultural produce in the Punjab.

Preamble.—Whereas it is expedient to provide for the better regulation of the purchase and sale of agricultural produce in the Punjab and for that purpose to establish markets and make rules for their proper administration, in the manner hereinafter appearing.

It is hereby enacted as follows :—

1. *Short title and extent.*—(1) This Act may be called the Punjab Agricultural Produce Markets Act, 1938.

(2) It extends to the Punjab.

2. *Definitions.*—In this Act, unless there is anything repugnant in the subject or context,

(*a*) " Agricultural produce " includes harvested cotton, wheat, barley, rice, oil-seeds, maize, gram, sugarcane (*gur* and *shakkar*) or any other crop which may hereafter be declared by notification to be agricultural produce for the purpose of this Act. But does not include fodder crops, standing crops or sugarcane used for chewing.

(*b*) " Notified market area " means any area notified under section 4.

(*c*) " Prescribed " means prescribed by rules or bye-laws made under this Act.

(*d*) " Grower of agricultural produce " shall not include a dealer or broker in that crop although he may grow that crop. If a question arises as to whether any person is a grower of agricultural produce or not for the purposes of this Act, the decision of the Deputy Commissioner of the district in which the person permanently resides shall be final.

(*e*) " Government " means the Government of the Punjab.

(*f*) " Trade allowance " includes such allowances as have the sanction of custom in the notified area concerned.

3. *Notification of intention of exercising control over purchase and sale of agricultural produce in specified area.*—The Government may, by notification declare their intention of exercising control over the purchase and sale of such agricultural produce and in such area comprised in a district, as may be specified in the notification. Such notification shall state that any objections or suggestions which may be received by the Government within a period to be specified in the notification, will be considered.

4. *Declaration of notified area.*—(1) After the expiry of the period specified in the notification under section 3 and after considering such objections and suggestions as may be received before the expiry of a specified period, the Government may, by notification and in any other manner that may be prescribed, declare the area notified under section 3 or any portion thereof to be a notified market area for the purposes of this Act in respect of the agricultural produce notified under section 3 or any part thereof.

From the date of issue of such notification or from such later date as may be specified therein, no person shall, within the notified market area, set up, establish or continue or allow to be continued any place for the purchase and sale of the agricultural produce so notified, except under a license granted by the Government and except in accordance with the provisions of this Act, the rules and bye-laws made thereunder and the conditions specified in the license.

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Explanation.—A person shall not be deemed to set up, establish, continue or allow to be continued a place, for the purchase and sale of an agricultural produce within the meaning of this section, if he sells his own crop outside the premises set apart by the market committee or if he purchases, in quantities not exceeding those prescribed, any agricultural produce for his private use.

(2) The Government may, on the report of the Deputy Commissioner of a district or of the market committee, and after such enquiry as they deem fit, cancel or suspend any license granted under sub-section (1).

5. *Establishment of market committee.*—The Government shall by notification establish a market committee for every notified market area. It shall be the duty of the market committee to enforce the provisions of this Act and the rules and bye-laws made thereunder in such notified market area and, when so required by the Government, to establish a market therein providing for such facilities including the issue of licenses to brokers, weighmen, measurers, and surveyors and warehousemen and other persons using the market as the Government may, from time to time, direct in connection with the purchase and sale of the agricultural produce concerned.

6. *Constitution of committee.*—(1) Every market committee shall consist of not less than 8 and not more than 16 members.

(2) Every market committee shall consist of persons appointed by Government by notification in accordance with the following provisions :—

> At least two-thirds of the members of the committee shall be selected from persons who are growers in the district in which the notified area is situated and persons licensed under section 4 in that area.

Subject to the above provision Government may appoint in addition by notification not more than three persons by office to be the members of the Committee.

(3) Every member shall hold office for a period of three years from the date of his nomination. Provided that Government may at any time during the period of his office remove by notification any member if such member has been guilty of misconduct or neglect of duty.

(4) Every market committee shall elect from among its members a chairman and a vice-chairman.

(5) If through death, retirement, transfer, or removal in accordance with the provisions of sub-section (3) any vacancy occurs, Government may appoint a member to fill such vacancy in accordance with the provisions of sub-section (2). Provided that the term of office of the members so appointed shall expire on the same date as the term of office of the vacating members would have expired had the latter held office for the full period allowed under sub-section (4).

7. *Incorporation of committee.*—Every market committee shall be a body corporate by such name as the Government may specify in the notification establishing it, shall have perpetual succession and a common seal, may sue and be sued in its corporate name, and shall, subject to the provisions of section 16, be competent to acquire and hold property, both movable and immovable, to lease, sell or otherwise transfer, any movable or immovable property which may have become vested in or been acquired by it, and to contract and to do all other things necessary for the purposes for which it is established.

Provided that no committee shall permanently transfer any immovable property except in pursuance of a resolution passed at a meeting by a majority of not less than two-thirds of the members of the Committee.

8. *Sub-Committee and Joint Committees and delegation of powers.*—The market committee may appoint one or more of its members to be a sub-committee for the conduct of any work or to report on any matter, and may delegate to any one or more of its members such of its own powers or duties in such manner as may be prescribed.

9. *Appointments and salaries of Officers and servants of market committee.*—(1) Subject to such rules as may be made by the Government in this behalf, a market committee may employ such officers and servants as may be necessary for the management of the market, may pay such officers and servants such salaries as it may think fit and shall have power to control and punish them. The committee may also in such manner as may be prescribed, provide for payment to its officers and servants of such leave allowances, gratuities or compassionate allowance as it deems proper; and may contribute to any provident fund which may be established for the benefit of such officers and servants.

(2) The committee shall, in the case of any officer or servant of Government whom it employs, pay Government such contribution towards the pension and leave allowances of such officers or servants as may be payable under the regulations in that behalf, in force for the time being.

10. *Execution of contracts.*—(1) Every contract entered into by the market committee shall be in writing and shall be signed on behalf of the market committee by the chairman and two other members of the committee and shall be sealed with the common seal of the committee.

(2) No contract other than a contract executed as provided in sub-section (1) shall be binding on a market committee.

11. *Levy of fees.*—The market committee may, subject to such rules as may be made by Government in this behalf, levy fees on the agricultural produce bought and sold by licensees in the notified area and Government shall make rules specifying maximum rates of the said fees.

12. *Market Committee Fund.*—(1) All moneys received by a market committee shall be paid into a fund to be called the " Market Committee Fund ". All expenditure incurred by the market committee under or for the purposes of this Act shall be defrayed out of the said fund; and any surplus remaining after such expenditure has been met shall be invested in such manner as may be prescribed by rules.

(2) (*a*) Every market committee shall, out of its fund, pay to the Government the cost of any special or additional staff employed by the Government in consultation with the committee for giving effect to the provisions of this Act in the notified market area.

(*b*) The Government shall determine the cost of such special or additional staff and shall, where the staff is employed for the purposes of more market committees than one, apportion such cost among the committees concerned in such manner as they think fit. The decision of the Government determining the amount payable by any market committee shall be final.

13. *Purpose for which the fund may be expended.*—Subject to the provisions of section 12 the market committee fund shall be expended for the following purposes only :—

(i) the maintenance and improvement of the market;

(ii) the construction and repair of buildings which are necessary for the purposes of such market and for the health, convenience and safety of the persons using it;

(iii) the provision and maintenance of standard weights and measures;

(iv) the pay, leave allowances, gratuities, compassionate allowances and contributions towards leave allowances or provident fund of the officers and servants employed by the market committee;

(v) the payment of interest on loans that may be raised for purposes of the market and the provision of a sinking fund in respect of such loans;

(vi) the collection and dissemination of information regarding all matters relating to crop statistics and marketing in respect of the agricultural produce concerned;

(vii) providing comforts and facilities, such as shelter, shade, parking accommodation and water for the persons, draught cattle and pack animals coming to the market, and similar other purposes;

(viii) the expenses incurred in auditing the accounts of the committee, and

(ix) with the previous sanction of the Government, any other purpose whereon the expenditure of the market is in the public interest.

14. *No trade allowance permissible except as prescribed by rules, or bye-laws.*—No trade allowance, other than an allowance prescribed by rules or bye-laws made under this Act, shall be made or received in a notified market area by any person in any transaction in respect of the agricultural produce concerned and no Civil Court, shall, in any suit or proceeding arising out of any such transaction, have regard to any trade allowance not so prescribed.

15. *Bar of suit in absence of notice.*—(1) No suit shall be instituted against any market committee or any member, officer or servant thereof or any person acting under the direction of any such committee, member, officer or servant for anything done or purporting to be done under this Act, until the expiration of two months next after a notice in writing, stating the cause of action, the name and place of abode of the intending plaintiff and the relief which he claims, has been, in the case of a committee, delivered or left at its office, and in the case of any such member, officer, servant, or person as aforesaid, delivered to him or left at his office or usual place of abode, and the plaint shall contain a statement that such notice has been so delivered, or left.

(2) Every such suit shall be dismissed unless it is instituted within six months from the date of the accrual of the alleged cause of action.

16. *Power to borrow.*—Every market committee may, with the previous sanction of the Government raise the money required for carrying out the purposes for which it is established on the security of any property vested in and belonging to the market committee and of any fees leviable by the market committee under this Act.

The committee may, for the purpose of meeting the initial expenditure on lands, buildings and equipment required for establishing the market, obtain a loan from the Government on such conditions and subject to such rules as may be prescribed.

17. *Supersession of market committee.*—(1) If, in the opinion of the Government, a market committee is not competent to perform or persistently makes default in performing the duties imposed on it by or under this Act, or abuses its powers, the Government may, by notification supersede such committee.

Provided that before issuing a notification under this sub-section the Government shall give a reasonable opportunity to the market committee for showing cause against the proposed supersession and shall consider the explanations and objections, if any, of the market committee.

(2) Upon the publication of a notification under sub-section (i) superseding a market committee, the following consequences shall ensue :—

(*a*) All the members including the chairman and vice-chairman of the market committee shall, as from the date of such publication, be deemed to have vacated their offices;

(*b*) all assets of the committee shall vest in the Government and the Government will be liable for all the legal liabilities of the committee subsisting at the date of its supersession up to the limit of the said assets;

(*c*) the Government may, at their discretion, by order constitute either a new committee under section 5 or some other authority for the carrying out of the functions of the committee, as the Government may think fit.

(3) (*a*) When the Government has made an order under clause (*c*) of sub-section (2), the assets and liabilities defined in sub-section (2) (*b*) vesting in the Government at the date of such order shall be deemed to have been transferred on the date of such order to the new committee or authority constituted as aforesaid.

(*b*) (i) Where the Government by order under paragraph (c) of Sub-section (2) of section 17 has appointed an authority other than a new committee for the carrying out of the functions of the superseded committee, the Government may by notification determine the period for which such authority shall act. Such period shall not be longer than 3 years.

(ii) At the expiry of the term of office of such authority, the Government may by order either reappoint the same or appoint some other authority for any period not longer than three years, or may by order consititute a new committee under the provisions of section 5 of this Act.

(iii) Upon such an order being made the assets and liabilities vesting in the authority thereby superseded, shall be deemed to have been transferred by such order to the new authority or committee appointed thereunder as the case may be.

(*c*) If the Government do not make such an order, they shall employ such assets for any object of public utility in the area specified in the notification issued under section 3.

18. *Penalties.*—Whoever contravenes the provisions of section 4 shall, on conviction, be punishable with fine which may extend to five hundred rupees, and, in the case of a continuing contravention, with a fine which, in addition to such fine as aforesaid, may extend to one hundred rupees for every day after the date of first conviction during which the contravention is continued.

19. *Powers to make rules.*—(1) The Government may, either generally or specially for any notified market area or areas, make rules consistent with this Act for carrying out all or any of the purposes thereof.

(2) In particular and without prejudice to the generality of the foregoing power such rules may provide for :—

(i) The nomination of members of a market committee ;

(ii) the powers to be exercised and the duties to be performed by the market committee ;

(iii) the election of the chairman and vice-chairman of such committee, their powers and term of office ;

(iv) the filling of casual vacancies in the office of members or in the office of chairman or vice-chairman of the market committee ;

(v) the time, place and manner in which a contract between buyer and seller is to be entered into and the money is to be paid to the seller, and

(vi) generally, for the guidance of the market committee and for carrying out the purposes of the Act ;

(vii) management of the market, maximum annual fees which may be levied by the market committee in respect of the agricultural produce bought and sold by traders in the notified market area, and the recovery and disposal of such fees ;

(viii) the issue by a market committee of licenses to brokers, weighmen, measurers and surveyors and warehousemen and other persons using the market, the form in which and the conditions under which, such licenses shall be issued or renewed, and the fees to be charged therefor ;

(ix) the place or places at which the agricultural produce shall be weighed, the kind and description of the scales, weights and measures which alone may be used in transactions in agricultural produce in a notified market area ;

(x) the periodical inspection, verification, regulation, correction, and confiscation of scales, weights and measures in use in a notified market area ;

(xi) the trade allowances which may be made or received by any person in any transaction in an agricultural produce in a notified market area ;

(xii) the provision of facilities by arbitration for the settlement of any dispute between a buyer and a seller of agricultural produce or their agents including disputes regarding the quality or weight of the article, the price or rate to be paid, allowances for wrappings, dirt, or impurities or deductions for any cause ;

(xiii) the prohibition of brokers from acting in any transaction on behalf of both the buyer and the seller of agricultural produce ;

(xiv) the provision of accommodation for storing any agricultural produce brought into the market ;

(xv) the preparation of plans and estimates for works proposed to be constructed partly or wholly at the expense of the market committee, and the grant of sanction to such plans and estimates ;

(xvi) the form in which the accounts of a market committee shall be kept, the audit and publication of such accounts, and the charges, if any, to be made for such audit ;

(xvii) the preparation and submission for sanction of an annual budget and the reports and returns to be furnished by a market committee, and

(xviii) the investment and disposal of the surplus funds of a market committee ;

(xix) the manner in which the auction shall be conducted and bids made and accepted in any market.

(3) Any rule made under this section may provide that any contravention thereof or of any of the conditions of any license issued or renewed thereunder shall be punishable with fine which may extend to five hundred rupees.

(4) (*a*) The power to make rules conferred by this section is subject to the condition of the rules being made after previous publication.

(*b*) All such rules shall be laid on the table of the Legislative Assembly for one month previous to the next session thereof and shall, subject to the provisions of section 21 of the Punjab General Clauses Act, be liable to be rescinded or modified by a motion of the said assembly tabled at the next session.

20. *Bye-laws.*—(1) Subject to any rules made by the Government under section 19, the market committee may, in respect of the market under its management, make bye-laws for :—

(i) the regulation of business,

(ii) the conditions of trading,

(iii) appointment and punishment of its officers and servants,

(iv) payment of salaries, gratuities, and leave allowances to such officers and servants, and contributions by them to any provident fund which may be established for the benefit of such officers and servants, and

(v) the delegation of powers, duties, and functions of the sub-committee, if any, appointed under section 8,

and may provide that contravention thereof shall be punishable on conviction, by a competent magistrate with a fine which may extend to fifty rupees.

No bye-law shall take effect until it has been published for information and subsequently confirmed by Government.

21. *Trial of offence.*—(1) No offence made punishable by section 18 of this Act shall be tried by a court inferior to that of a District Magistrate or a Magistrate of the first class.

(2) Prosecutions under this Act may be instituted by any person duly authorised in writing by the market committee in this behalf.

(3) All fines received from an offender shall be credited to provincial revenues and a grant equivalent to such fines shall be paid to the market committee.

22. *Recovery of sum due to Government from market committee.*—All sums due from a market committee to the Government may be recovered in the same manner as arrears of land revenue.

STATEMENT OF OBJECTS AND REASONS.

The Royal Commission on Agriculture in India came to the conclusion that the agriculturist did not get a fair price for his produce and recommended the establishment of regulated markets in order to overcome some of the evils which deprived him of such a price.

Careful enquiries conducted under the guidance of the Marketing Adviser to the Government of India have brought to light startling facts for instance, out of a rupee which the consumer pays for his wheat or rice the producer gets only 9½ annas. Similarly the grower of linseed gets about 60 per cent. while the grower of tobacco in Guntur gets only about 44 per cent. of the price paid for these commodities in the United Kingdom. The producer of *ghi* gets between 60 and 70 per cent. of the final price. The position as regards fruit is worse. The grower of grapes in Nasik gets less than half the price paid by the consumer in Bombay. The producer of Kashmir apples has to be content with only about 20 per cent. of what the consumer pays. For bananas and oranges 30 to 40 per cent. is about the most the producer can expect.

It is true that the producer cannot get the whole of the price paid by the consumer for the simple reason that cost of carriage and fair return for the services of the middleman must necessarily be allowed for. But it is equally true that if the malpractices to which the producer is subjected and the numerous charges which are levied him from under one pretext or another are abolished or properly regulated according as circumstances seem to justify or permit appreciably higher prices can be secured for the producer.

The grower has no voice in the regulation of the various fees charged from him and notwithstanding the large amounts which he pays in the form of multifarious dues no amenities or comforts are provided for him in any of the markets of the province.

Many of the dues having the sanction of usage have to be paid, generally, by the seller alone. These are :—

(1) *Arhat*, that is, the commission payable to the *arhati*.

(2) *Dalali*, that is, the commission payable to the broker.

(3) *Tulai*, that is the dues payable to the weighman.

(4) *Rolai*, that is, the dues payable to the man who roughly dresses the produce as it is put into the scale-pan.

(5) *Charhai*, that is, the dues payable to the man who fills the scale-pan.

(6) *Otai*, that is the dues payable to the man who holds open the mouth of the bag.

(7) *Munimi*, that is, the dues payable to the arhati's scribe.

(8) *Palledari*, that is, the dues payable to porters. Barring *arhat* and *dalali* which are payable in cash other dues are payable in kind.

In addition to the above, small deductions in kind are also made on behalf of the sweeper, the chaukidar, the waterman, the arhati's cook and the beggars.

Some cash deductions, such as dharmada, gaushala and pathshala, are also made in the name of certain charities. The proceeds from these deductions are seldom applied to the objects for which they are ostensibly made. The bulk, if not the whole, of these proceeds become, in actual practice, the private property of the buyer.

Excess weight deliverable by the seller is also in vogue in most markets, a *maund* being conventionally taken to mean, say, forty-one *seers*.

Karda, a deduction in weight on the conventional plea of the existence of impurities is also customary in many places.

Sometimes after a part of the produce has been weighed out the buyer notifies the seller of his refusal to purchase the balance at the rate settled between the parties on the unfair plea that it is inferior in quality to the commodity in the upper portions of the cart, this being a dishonest device to compel the seller to part with the balance at a lower price for reasons which can be easily understood.

Weights in use also present a bewildering variety of standard from place to place. A " seer " , for instance, may be equal to 32, 80, 85 or 102 tolas. This variety places the producer who is, in nine cases out of ten, innocent of a workable knowledge of arithmetic, at a serious disadvantage in the matter of checking the calculations of the buyer.

All or most of these abuses are found to flourish in each part of the province with the result indicated in paragraph 2. The actual return which the agriculturist gets for his produce is further depressed as a result of the use of inaccurate weights and scales. The report of Punjab Banking Enquiry Committee summarises the results obtained by extensive investigations into this subject under the auspices of the Board of Enquiry. It is apparent from the summary contained in this report that 69 per cent. of the scales tested and 42 per cent. of the weights checked were found to be incorrect. Further, some of the shopkeepers are reported to keep two sets of scales and weights, one for buying and the other for selling.

It is impossible to measure the havoc wrought by false weighing, but it is believed to range round five per cent.

The evils to which reference has been made above have a most disastrous effect on the economic condition of the producer, and it is with a view to eliminate or mitigate these evils that the present legislation is being undertaken.

Legislation of analogous character already exists in Bombay, Central Provinces, Madras and Hyderabad.

CHHOTU RAM,
Minister-in-charge.

S. L. SALE,
Secretary to Government, Punjab,
Legislative Department.

Simla, S.W.
The 14th July 1938.

ABNASHA SINGH,
Secretary, Punjab Legislative Assembly.

APPENDIX XV

Progress in the Introduction of Improved Varieties of Cotton.

BOMBAY.—*Broach tract.*—During the year, the Agricultural Department controlled 26,618 acres including 1,160 acres grown with Surat Farm seed. The Mulad and Karanj Co-operative Cotton Sale Societies were included in the Departmental group system to meet heavy demands from some Indian States.

The Department purchased in all 26,43,064 lb. of seed of which 18,800 lb. were the produce of the Surat Farm. The quantity of seed supplied from 24 depots in the district amounted to 1,275,661 lb. including 189,006 lb. directly supplied by Co-operative Societies. Including the supply of 1,660,449 lb. to Rajpipla and other Indian States, the total quantity of seed handled was 2,936,110 lb.

With the passing of the Cotton Control Act of 1935, intensive propaganda and field to field survey work, *Goghari* has been totally eliminated from the tract. Enquiry, however, had revealed that the place of *Goghari* has been taken by the *Surat* 1*A* cotton in many villages of the Jalalpore and Bardoli talukas where *Goghari* was formerly grown.

In order to maintain the reputation of *Surat* cotton, early steps to amend the Cotton Control Act of 1935 prohibiting the growing and handling of any cotton other than 1027 A.L.F. in the tract south of the river Tapti are necessary.

DECCAN.—*Ahmednagar District.*—Owing to favourable rains, *Banilla* seed obtained from Amalner was distributed over a concentrated area of about 3,350 acres. The natural spread from the last year's seed was about 1,000 acres. During the year the ginning percentage of *Banilla* was higher than the local and *Banilla* fetched Rs. 2, per *Palla* more than the local cotton.

Sholapur District.—Owing to practical failure of the *Kharif* rains during 1937-38, the rain-fed cotton crop failed. The irrigated area under *Banilla* cotton was 2,500 acres as against 1,272 acres under local, irrigation being mostly from wells. The yield of *Banilla* ranged from 700–1,000 lbs. of seed cotton per acre. This strain has become popular with the cultivator and it fetches Rs. 5 to Rs. 10 more per *khandi* of 500 lb. of seed cotton.

Satara District.—Out of 10,572 acres under *Gossypium Herbaceum* varieties in the southern part of the district, 2,500 acres were under *Jayawant* cotton. Two open auction sales were arranged for the sale of *Jayawant* cotton at Sangli with fair success, and the cultivators realised a premium of Rs. 8 to Rs. 10 per cart over local cotton.

Deccan Canals.—Due to fall in price of cotton, serious attack of wilt, unfavourable season and fall in yield, the area under cotton has not increased. The yield has fallen from 1,500 to 750 lb. per acre of seed cotton. Out of 21,000 acres only 6,000 acres were under *Banilla*. The Department distributed 62,239 lb. of *Banilla* seed during the year.

Khandesh.—*Jarila* is the improved variety of cotton evolved for the Khandesh tract. This cotton is much superior to local and *Banilla* in staple and is highly wilt-resistant; its yield and ginning outturn are equal to those of the local variety. It is suited to conditions obtaining in Khandesh and is much appreciated both by the cultivator and the trade. A scheme financed by the Indian Central Cotton Committee for the multiplication and distribution of seed of this variety was launched during the year. 6,868 lb. of pure seed obtained from the Jalgaon Farm were distributed to reliable cultivators for multiplication in concentrated area covering 390 acres. An area of 135 acres was also grown to this cotton on the Jalgaon and Bhadgaon Farms. Besides, it is estimated that an area of about 525 acres was under this improved variety under natural spread from seed preserved by progressive cultivators who had grown it for trial in the 1936 season. The total area under *Jarila* is thus 1,050 acres. Pure seed produced on Government Farms and on the controlled area has been secured and a quantity of 85,115 lb. has been stocked for distribution for the 1938-39 season. A further supply of 13,325 lb. has been stocked by growers for further multiplication.

Distribution of seed of *Banilla* cotton, which was under extension in Khandesh so far, was not altogether given up as seed of the new improved variety (*Jarila*) was not available in the required quantities. Accordingly, 241,695 lb. of *Banilla* cotton seed were distributed in Amalner, Shirpur, Jalgaon, Malegaon and Nandgaon ; some of the seed remained unsown for want of adequate rains at the sowing time. *Banilla* cotton seed was also distributed by private agencies like seed merchants, Purchase and Sale Unions, Taluka Development Associations and Landlords. The total quantity so distributed was 168,528 lb. It is estimated that as a result of seed distribution and natural spread an area of about 60,000 acres was under this variety in 1937-38. The outturn during the year is estimated at 13,000 bales or on an average 86 lb. of lint per acre.

Kumpta-Dharwar tract.—The work of introducing two improved varieties of cotton, *viz.*, *Jayawant* and *Gadag No.* 1 was carried out on an extensive scale through local agents and the Hubli and Gadag Co-operative Cotton Sale Societies, with the aid of funds provided by the Indian Central Cotton Committee and the Government of Bombay. The reserved area maintained for multiplying pure and pedigree seed of *Jayawant* cotton at different centres was 37,991 acres against 25,006 acres last year and that under *Gadag No.* 1 at Gadag and Ron centres was 19,858 acres against 22,614 acres in the previous year. The quantity of seed received by the local agents and the Co-operative Cotton Sale Societies from these reserved areas was 4,477,986 lb. of *Jayawant* and 1,452,679 lb. of *Gadag No.* 1 sufficient to cover 447,798 and 145,267 acres respectively during 1938-39.

For distribution of the general pedigree seed stocked by the local agents and the Cotton Sale Societies, seed depôts were opened as usual at selected centres. The general area under pure *Jayawant* was 207,327 acres against 75,711 acres last year and that under pure *Gadag No.* 1 was 72,921 acres against 61,796 acres in the previous year. The estimated yield of *Jayawant* cotton was 20,000 bales against 10,071 bales last year, and 11,000 bales of *Gadag No.* 1 against 8,441 bales in the previous year.

Jayawant cotton obtained on an average a premium of Rs. 15, per *Naga* of seed cotton (1,344 lb.) in auction sales and *Gadag No.* 1 Rs. 20 more per *Naga*.

SIND.—During the decade prior to the opening of the Lloyd Barrage, the annual area under cotton cultivation in Sind averaged about 300,000 acres with an annual average outturn of 100,000 bales. With the advent of the Barrage canals, and early and assured water supply and increased interest in cotton growing, the area increased to 1,049,151 acres (including Khairpur State) in the year 1937-38 with an outurn of about 394,010 bales. The area under Sind-American cotton was 653,021 acres in 1937-38 against 561,206 acres in 1936-37.

Three main varieties of cotton found to be successful in Sind are (1) Sind *Deshi* (*b*) Sind-American and (*c*) Imported Sea Island cotton.

From these the Department of Agriculture in Sind has, by botanical selection, evolved improved strains which on account of better yield, high ginning outturn or superior quality, are suitable for general cultivation in the different cotton growing tracts of the Barrage areas.

Sind Deshi Cotton.—The total area under *Deshi* cotton in 1937-38 was 396,130 acres (including Khairpur State) with an estimated outturn of 153,819 bales of cotton. The improved Sind *Deshi* strain 27 W. N. now known as '*Sind N.R.*' cotton, evolved by the Agricultural Department, gives an early and abundant crop (about 16-20 per cent. more yield and 4-5 per cent. higher ginning outturn than ordinary Sind *Deshi*. This improved strain is the standard *deshi* cotton in Sind. About 15,082 maunds of seed of this variety were distributed by the Agricultural Department for further multiplication in 1938-39.

Sind-American Cotton.—This cotton occupied in 1937 about 653,021 acres out of the total area of 1,049,151 acres under cotton. 4F was the most popular variety first grown in Sind. It was partly replaced by other types, *viz.*, 289F, N. T. and K. T. The latter two types proved to be easily affected by red leaf disease and jassid attack and have been

therefore given up. The improved strains, established by the Agricultural Department, seed of which is being rapidly multiplied on a large scale, are definitely superior to the ordinary Sind-American. These are Sind-American 4F–98, Sind *Sudhar* 289F-1 and Improved Sea Island.

Sind-American (*4F-98*) gives high yield, has a ginning outturn of 33 per cent. and a staple length of $\frac{7}{8}$″ to 15-16″ and it spins 34's. It has been found to be the most suitable type for cultivation in the new cotton growing tracts, which are being established on the right bank of the Indus. In fact, it comprises the bulk of the crop in these areas. About 8,000 maunds of seed of this cotton have been distributed by the Agricultural Department for further multiplication in 1938-39.

Sind-Sudhar (*289F-1*).—This improved strain has full 1″ staple, spins 40's, has a ginning outturn of 29-30 per cent and gives a very high yield in normal years. This cotton is more resistant to red leaf disease and jassid attack and can withstand seasonal variation of climate better than ordinary Sind-American. It is now being grown in general cultivation all over Left Bank of Indus where the present cotton area is mostly located. The good premium obtained for this cotton during the past few years has resulted in considerable increase of the area under it. The Agricultural Department distributed 33,169 maunds of seed of this improved cotton for further multiplication in 1938-39.

Improved Sea Island Cotton.—Selected strains of this variety, acclimatised in Sind have been produced by the Sind Agricultural Department. Out of these, Sea Island 2-4 has a staple length of 1¼″ to 1½″ and is suitable for spinning 70 to 80's. It has been tested on a field scale and is found to grow well in East Sind. It is, however, susceptible to seasonal variations and white ant attack, specially on virgin soils. The average yield during the year 1937-38 was, however, low, *viz.*, 5·6 maunds *kapas* per acre. This fine quality cotton requires better soil and better cultivation than Sind-American or *desi* cotton. During the year 1937, the area under this variety under the supervision of the Agricultural Department was about 1,000 acres. The Department distributed about 110 maunds of improved seed for further multiplication in 1938-39. For successful cultivation of long staple and fine quality cottons it is necessary to evolve a reliable marketing organisation which will secure adequate premium for quality.

Extension and pure seed multiplication.—The pure seed extension scheme based on the ' unit ' system and consisting of five progressive stages, *viz.*, (1) seed patch 2½ acres, (2) increase block 25 acres, (3) field scale planting 250 acres, (4) village group 2,500 acres, and (5) district group 25,000 acres was in full operation. The number of units, each representing a final area of 25,000 acres under one improved variety increased from 10 to 24 in 1936 and the first three stages were sown in 1937 according to this revised scheme. Out of 24 units, 18 have been fixed for improved Sind-American cottons, 1 for high quality cottons and 5 for Sind N. R. cotton.

The produce of the first four stages of the seed multiplication scheme was ginned under the supervision of Agricultural Department and 56,262 maunds of sound seed of improved strains was produced and distributed for sowings in 1938-39.

MADRAS.—I.—*The Southerns Tract*—(A) *Cambodia—Coimbatore and Salem Districts.*—The strain Co.2 has been under distribution for over a decade and the *ryots* have realised its merits. Demand for pure seed of this strain is very great and is met by seed farms in the lands of selected cultivators. They are under contract to grow the cotton pure and gin it under supervision. The seed is obtained at a premium rate after testing its germination capacity. The lint also fetches a premium, over the best local rate. The premium for lint during 1937-38 was Rs. 27 per candy in the inner area seed farms.

The seed farm area is worked in two units, *viz.*, an inner area controlled directly and exclusively by the Agricultural Department and an outer area managed and controlled by the Tiruppur Co-operative Sale Society. The seed is sold in sealed-bags to *ryots* within the two districts and a small part is also supplied to other districts. The

statement below gives details of the seed farm area controlled by the Agricultural Department in the years 1936-37 and 1937-38.

Year.	Number of societies.	Number of ryots.	Taluka where seed farm area located.	Area of seed farms in acres.	Quantity of lint obtained. Candies. lb.	Quantity of seed produced. lb.
1936-37	Inner area 4 ..	166	Palladam ..	939	101 166	146,863
	Outer area 23	765	Palladam and Avanashi.	5117·23	641 124	863,282
Total ..	27	931		6056·23	742 290	1010,145
1937-38	Inner .. 3	150	Palladam ..	961·50	171 764	238,319
	Outer 17	650	Palladam and Avanashi.	5350·00	1124 384	1384,152
Total ..	20	800		6311·50	1296 364	1622,471

Two strains of Cambodia, *viz.*, 920 and 1,267 released three years ago, have also been under distribution, the seed being derived from private seed farm and the Government Agricultural stations. From the latter source, 6,925 lb. of 920 seed and 7,192 lb. of 1,267 seed were distributed and both the varieties together covered an area of 2,905 acres, of which 2,300 acres were under natural spread.

The area under Co.2 and the estimated production therefrom are shown below :—

District.	*Area in acres.*	*Yield of lint in bales of 400 lb. each.*
Coimbatore	138,723	57,592
Salem	38,394	30,715
Total ..	177,117	88,307

Of the total area shown in column 2 above, 27,888 acres were under departmental seed and the rest of the area under natural spread.

A. (2) *Cambodia cotton—Madura and Tinnevelly Districts.*

Seed farms (Acres).	*Madura.*	*Tinenvelly.*	*Total.*
Cambodia	284	..	284
Area under cotton (Acres).			
Cambodia	45,578	9,328	54,906
Quantity of seed distributed (lbs.)			
Cambodia	1,28,361	13,646	1,42,007

A. (3) *Cambodia cotton—Ceded Districts.*

The seed was obtained from Tiruppur and distributed. A total quantity of 3,465 lb. of seed was sold during the year, and the area under departmental seed was 392 acres against 314 acres in the previous year. The area under natural spread was estimated to be 1,690 acres against 1,278 acres in the previous year.

B. (1) *Karunganni—Coimbatore and Salem Districts.*

Ever since the introduction of Karunganni cotton nearly 2 decades ago the departmental strain C·7 has been under distribution and has attained great popularity in the Coimbatore district. Demand for pure seed is met by seed farms under departmental control. Particulars of these are given below :—

Year.	No of ryots.	Taluka where the seed farms are located.	Area of seed farm in acres.	Quantity of lint produced. lbs.	Quantity of seed produced. lbs.
1936–37	21	Udumalpet..	694	49,775	94,337
1937–38	6	,, ..	868	40,843	84,777

The total area under this strain is estimated to be 56,062 acres. Of this 9,742 acres are under departmental seed and 46,320 acres are under natural spread. The estimated production of lint of this strain is 9,963 bales of 400 lb. each.

B. (2) *Karunganni—Madura and Tinnevelly Districts.*

Seed farms-(acres).	*Madura.*	*Tinnevelly.*	*Total.*
Karunganni	200	1,001	1,201
Area under cotton (acres).			
Karunganni	26,277	1,21,466	1,47,743
Quantity of seed distributed (lbs.)			
Karunganni	45,610	81,232	1,26,842

C. *Northerns Tract—N.* 14 *cotton—Ceded Districts.*

A good demand has been created for this quality cotton since 1935-36. During that year seed farms were started to supply pure seed to *ryots*. The work received an impetus by the premium of Rs. 30 per candy of 500 lb. lint paid by Messrs. Binny & Co. over local white Northerns. The same premium was paid in 1936-37 and again in 1937-38. The seed farm area during 1937-38 was 189·90 acres distributed in the three *talukas* of Nandyal, Koilkuntla and Sirvel. The quantity of seed distributed during 1937-38 was estimated to be 23,174 lb. The area under this crop being estimated at 4,368 acres. The average yield of seed cotton was 160 lb.

D. *Westerns Tract—H.* 1 *cotton—Ceded Districts.*

During the year 1937-38 the area under seed farms was 2,979 acres against 2,554 acres in the previous year. 204,179 lb. of seed sufficient to sow about 17,015 acres was distributed during the year against 148,087 lb. in the previous year. The area under natural spread was estimated at 200,700 acres.

Owing to very bad season the yield was far below normal and the average per acre ranging from 8 to 25 lb. of lint. This variety fetched a premium of Rs. 4 per bale of 400 lb. lint as in the previous year.

CENTRAL PROVINCES AND BERAR.—Considerable progress has been made in the extension of area under improved strains of cotton and in the multiplication of pure seed of such strains. During the season V. 434 occupied about 43,000 acres against 20,000 in the previous year. Grown under a wide range of soil and climatic conditions, V. 434 has been found to be the best all-round type of cotton available at present. On account of its superior lint, greater adaptability to variations of climate and better yield, etc., it is gradually replacing other *Verum* strains. It has a fine long lint, capable of spinning 33's highest standard warp counts. During the past season its lint fetched a clear premium of Rs. 36–8 per *candy* over local *Oomras*. Large quantities of pure seed of V. 434 were raised on the various Government farms and distributed throughout the province.

Late *Verum* occupied an area of 16,962 acres and was grown in areas where the monsoon, comparatively speaking, lasts till rather late in the season. The all-round suitability of V. 434, however, and the desirablity of having as few types as possible under cultivation in adjoining areas, are strong reasons in favour of V. 434 except in places where late *Verum* is definitely the better suited type.

A scheme has been initiated this year with the object of replacing the local *Buri* (*G. hirsutum*) cotton of Burhanpur *Tahsil* by an improved type, *Buri*, 107 evolved by the Department of Agriculture. The aim is to effect complete substitution in 30,000 acres within three years, with the possiblity of further extension later.

PUNJAB.—The total area under cotton in the British district of the Punjab, during the year 1937–38 was 3,135,531 acres against 2,909,152 acres last year. Of the total area, 1,440,422 acres were under Punjab-American varieties and 1,695,109 acres under *desi* cottons. Both the total acreage of cotton and the acreage under Punjab-American varieties showed a further increase on last year's record for the province. The increase in area is due to high prices prevailing for cotton in the previous year, favourable climatic conditions and a satisfactory supply of canal water at sowing time. During the year under report the area under Punjab-American cotton was grown under varieties introduced by the Agricultural Department. The total outturn was 1,204,333 bales as against last year's figure of 1,467,997.

A brief description of the improved strains is given below :—

American Cotton—(*a*) 289*F*–43.—This is a long stapled, high yielding, early maturing and jassid resistant variety. Its fibre length is 1 1/32 inches, it spins 40 counts and has a ginning outturn of 29%. The most noteworthy features of this variety are its tolerance to shortage of water and its early maturing habit. It is, therefore, most popular in the south-western part of the province, the tract mostly commanded by inundation canals. This variety is also very successful in Lower Bari Doab Canal Colony (except Khanewal Division), Nili Bar and in Lower Chenab Canal Colony.

(*b*) *L.S.S.*—This strain, which is a selection from 4-F, is tall, stout and jassid resistant. It is a high yielding but late maturing variety. Its fibre length is 1 inch and it spins 40 counts; its ginning outturn is about 31%. It is being grown on large areas in Lyallpur, Sheikhupura and parts of Sargodha districts.

During the year the area under the improved American varieties was as follows :—

	Acres.
4–F.	1,008,261
289–F.	83,087
43–F.	55,555
L.S.S.	128,017
Others	138,617
Total	1,413,537

Improved Desi varieties—(*a*) 39 *Mollisoni*.—It is the highest yielder among *Desi* varieties and forms the bulk of the *desi* crop in the canal colonies. Its lint length is $\frac{4}{8}$" and its ginning percentage is 36.

(*b*) *Jubilee cotton*, is a cross Chinese Million Dollar and Punjab Mollisoni and combines the long lint of Chinese cotton with good ginning outturn and high yield of Punjab Mollisoni. It possesses medium staple, good ginning outturn and disease and drought resistant characters. It spins 20's counts. It compares with the ordinary *desi* and 4-F as follows in price and spinning qualities :—

Variety.	Price per maund of lint.	Price per maund of kapas, 1937–38.	Spinning counts.
	Rs. a. p.	Rs. a. p.	
4-F	21 2 0	6 7 9	21's
Jubilee cotton	20 8 6	6 4 0	20's
Mollisoni	17 5 0	5 7 0	8's

This variety is now being tried extensively in many parts of the province and it is hoped that it will very largely replace Mollisoni and 4-F in the near future.

(*c*) 119 *Sanguineum* is an early maturing strain of *sanguineum* cotton, especially suitable for the inundation tracts of the South-Western Punjab. It is a very high yielding variety and gins 38%. It is now under very extensive trials in the province and it is expected to suit the dry tract of South-Western Punjab and to be more remunerative than the types grown there at present.

(*d*) 12 *Sanguineum*, a late maturing high yielding variety of Multani cotton, is drought resistant and grown in the rain-fed areas of Rawalpindi and adjoining district. It is a fine quality cotton and spins about 12's counts.

The area under improved varieties was as follows :—

	Acres.
Mollisoni	957,865
Sanguineum	26,881
Rosea	17,372
Others	54,331
Total	1,056,449

RAJPIPLA STATE.—The Rajpipla State has since the year 1921 in operation an Act prohibiting the growing of *Goghari* and other low varieties of short staple cotton and regulating by license the working of cotton ginning and pressing factories within its territories. The State has introduced since 1921 the improved strain of long staple cotton known popularly as 1027 A.L.F. variety. For the last 17 years it has continued its policy of maintaining the purity of this crop throughout the State. This is achieved (*i*) by the annual distribution of selected seed obtained by special arrangement, (*ii*) by the rigorous enforcement of the provisions of the Cotton Improvement Act which penalises the sowing or importing into the State for any purpose the *Goghari* or any other short staple cotton seed, and (*iii*) by controlling the ginning and pressing factories and rigorously seeing that no other variety is mixed with the pure 1027 A.L.F. crop of the State.

For the year 1937–38, the supply of the best quality of 1027 A.L.F. variety of seed was secured partly by selection from the local crop and partly by obtaining direct supply through the Cotton Superintendent, Surat District. This seed was distributed liberally as usual to the cultivators by way of *Taqavi* in order to maintain the high quality of the crop of this State. The output for the year was 26,668 bales of full pressed cotton (excluding about 10,500 bales taken by the cultivators for ginning and pressing outside the State).

Rajpipla cotton is known also by the name of Jhagadia cotton in the market and is recognised as equal to the best and is largely sought after. It maintained during the year its high standard of purity and superiority over short staple varieties and found a ready market at a high premium throughout the season.

BARODA STATE—(1) *Navsari District.*—The total seed of 1027 A.L.F. variety issued for 1938–39 season was 369,706 lbs. estimated to cover about 60,000 acres. The Vesma Cotton Farm completes the organization of seed-supply. The introduction of the Cotton Control Act, backed by special measures of investigation and survey, has resulted in reducing the evil of the spread of *Goghari* to negligible proportions. The incidence on the total area surveyed was less than 0.2%, the individual variation being 1 to 2%.

(2) *Baroda District.*—B.D. 8 cotton seed was issued in areas free from wilt. The State has now its own cotton farm at Dabhoi and the foundation of the organization for B.D. 8 cotton is thus laid.

(3) *Mehsana District.*—*Wagad* 8 continued to be the best cotton in the district and reliable seed supplies were arranged. Two new segregates, *viz.*, 4–1, and 7–1 along with Wagad 8, at Jagudan Farm have shown superior yields in the Dholleras cotton Improvement Scheme of the Indian Central Cotton Committee.

(4) *Amreli District.*—The Dholleras Improvement Scheme continued to function on the Amreli Farm under the technical guidance of the Cotton Breeder at Viramgam. The intensive study of Mathio cotton was taken up at the Amreli Farm.

HYDERABAD STATE.—The system of distribution of improved cotton seed was continued on *Taqavi*, as usual. Seed of the following varieties was distributed in the various localities.

Gaorani tract.—The distribution of seed of the ordinary local Gaorani cotton was completely stopped, as an improved variety had become available. The seed of Gaorani 6 amounting to 766,806 lbs. was distributed in the Nanded district over an area of 40,000 acres.

Aurangabad District.—Distribution of the seed of *Banilla* variety was continued with the object of replacing the local mixture, the seed distributed being 27,840 lbs. over an area of 1,546 acres.

Raichur District.—The distribution of improved varieties of cotton seed was continued in the Kumpta Protected Area, in order to replace the inferior varieties of local Kumpta and Dharwar-American. 253,004 lbs. seed of the Jayawant variety was distributed over an area of 20,002 acres and 10,941 lbs. seed of Gadag No.1 was distributed over an area of 1,060 acres.

*Section of the Act.	Purpose.	Central Provinces and Berar.
2A(1) By †Rules under the Section.	Authority for granting a license for working cotton ginning or cotton pressing factory.	Director of Industries.
3A Explanation. By †Rules under the Section.	Grant of certificate as to the normal quantity of moisture a given quantity of cotton should possess and also the quantity of moisture it possesses.	Agricultural Chemist to Government, Central Provinces and Berar.
3A By †Rules under the Section.	To receive complaints of contraventions of Section 3A.	Chief Inspector of Boilers and Factories.
3B By †Rules under the Section.	To examine cotton or the contents of a package or bale and to grant a certificate.	Agricultural Chemist to Government, Central Provinces and Berar.

* These Sections relate to the Cotton Ginning and Pressing Factories (Central Provinces Amendment) Act.

† These Rules have been passed by the Local Government.

APPENDIX XVI.

BALANCE SHEET AS AT 31st MARCH 1938.

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Cotton Cess Receipts	1,20,10,056 2 7		I. A. Administration		19,12,485 12 9*
Less Refunds of cess to Burma	42,369 10 9	1,19,67,686 7 10	B. *Improvement of Cotton Marketing.*—		
			1. Cost of Exhibits, travelling allowance of representatives on the Board of the East India Cotton Association and members of the Standards Sub-Committee	1,13,505 2 2	
Interest account :—			2. Enquiry into the cost of cotton production in India	2,58,790 12 6	
Amount received on investments	18,44,028 12 1				3,72,295 14 8
Add :—Refund of income-tax from interest ..	19,393 2 0		C. *Seed Distribution and Extension Schemes*:—		
	18,63,421 14 1		(i) *Bombay* :—		
Less :—			(1) Hubli	44,065 9 3	
1. Interest paid in advance at the time of purchasing Govt. Paper (since recovered), interest on temporary overdrafts and Bank's commission for collection of interest	57,204 4 3		(2) Gadag	41,706 11 1	
			(3) Gadag Supplementary	20,167 11 4	
2. Interest credited to Provident Fund account	4,886 6 2		(4) Surat	63,006 15 10	
3. Bank's withdrawal charges	4,658 15 0		(5) Athani	18,086 1 7	
4. Income-tax on interest on Govt. Paper ..	21,492 5 1		(6) Khandesh (Banilla)	1,61,713 13 6	
5. Brokerage for securities sold	828 10 0		(7) ,, (Jarila)	12,075 0 0	
6. Provision for Sinking Fund	9,626 11 0		(8) Deccan Canals (Banilla)	—252 8 7	
	98,697 3 6		(9) B.D. 8	6,540 7 0	
		17,64,724 10 7	(10) Revised Jayawant	43,969 10 11	
Profit on conversion and sale of securities ..		2,50,459 10 2	(11) Gadag No. 1	15,327 5 6	
Sinking Fund account		9,626 11 0	(12) Maintenance of nucleus of seed of each variety of cotton	2,320 0 0	
Miscellaneous receipts		53,871 15 6	(ii) *Madras*:—		
Refund from Provident Fund for contributions disallowed		3,391 1 11	(1) Pay and allowance of Business Manager, Tiruppur	24,264 2 3	
Suspense receipts		17 8 0	(2) Co. 2	40,836 15 3	
			(3) H. 1	3,952 2 9	
			(iii) Sind	3,02,606 0 10	
			(iv) Hyderabad	33,167 12 1	
			(v) Central Provinces—Extension of long staple cotton and marketing of Verum cotton..	2,23,270 2 5	
			(vi) Baroda	12,036 6 5	
			(vii) Lyallpur Ginnery	16,038 3 3	
			(viii) United Provinces C. 402	19,198 7 0	
					11,04,097 1 8
			D. *Printing and Propaganda*:—		
			(1) Publicity and Propaganda	1,44,025 9 9	
			(2) Printing and Distribution	61,247 3 6	
					2,05,272 13 3
Carried forward		1,40,49,778 1 0	Carried forward	....	35,94,151 10 4

* Includes travelling allowance of non-official members.

BALANCE SHEET AS AT 31st MARCH 1938—*contd.*

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Brought forward		1,40,49,778 1 0	Brought forward		35,94,151 10 4
			E. *Statistical Research :—*		
			(1) Studies of village consumption of Indian cotton	22,577 5 2	
			(2) Improvement of cotton forecasts ..	20,760 5 3	
					43,337 10 5
			II. *Technological Research*		
			(1) *Technological Laboratory :—*		
			A. *Capital Expenditure :—*		
			(1) Land and Buildings	4,07,988 14 6	
			(2) Machinery	98,573 0 10	
			(3) Freight	7,502 2 8	
			(4) Apparatus and Equipment	41,558 3 7	
			(5) Machinery Workshop	5,789 8 3	
			B. *Working Expenses :—* ..	20,17,159 6 11	
			(2) Provincial	1,18,023 6 10	
			(3) Development of alternative uses for Indian cotton	10,238 9 11	
					27,06,833 5 6
			III. Research studentships	2,65,575 7 1	
			Less :—Refund from Mr. Taskhir Ahmad	995 4 0	
					2,64,580 3 1
			AGRICULTURAL RESEARCH GRANTS.		
			IV. *Bombay :*		
			1. A. Surat Physiological ..	2,45,139 11 3	
			B. ,, ,, writing-up ..	5,814 7 8	
			2. A. Surat Boll-worm	1,14,509 9 7	
			B. ,, ,, Propaganda.	91,468 9 2	
			C. ,, ,, Writing-up.	2,315 3 0	
			3. A. Dharwar Wilt	1,82,836 4 11	
			B. ,, ,, writing-up.	10,902 10 3	
			4. Khandesh	26,573 5 0	
			5. Co-ordination of Cotton Research	1,749 7 6	
			6. Jalgaon Cotton Breeding ..	45,085 10 3	
			7. Broach Cotton Breeding ..	56,219 3 8	
			8. Small Leaf Disease Survey ..	3,938 9 6	
			9. Survey of Goghari Cotton ..	3,352 6 0	
			10. Defibration of cotton seed ..	5,568 0 4	
			11. Plant Puller Propaganda ..	11,814 7 3	
Carried forward		1,40,49,778 1 0	Carried forward	8,07,287 9 4	66,08,902 13 4

BALANCE SHEET AS AT 31st MARCH 1938—*contd.*

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Brought forward		1,40,49,778 1 0	Brought forward	8,07,287 9 4	66,08,902 13 4
			12. Breeding of Wilt Resistant cottons for Surat area ..	2,511 8 0	
			13. Inclusion of Northerns and Westerns in Dry Farming Scheme at Bijapur	1,466 14 9	
			14. Poona Wilt Breeding	10,226 10 0	
			15. Extra clerk for the Bombay Presidency Schemes	1,680 0 0	
			V. *Madras* :—		
			1. Herbaceum	1,40,409 12 6	
			2. Pempheres and Physiological ..	1,38,152 2 10	
			3. Fodder Cholam	19,517 9 4	
			4. Breeding of Nadam cotton ..	11,509 6 8	
			5. Improvement of Mungari cotton	362 0 0	
			VI. *Punjab* :—		
			(*a*) Botanical	5,24,097 11 1	
			(*b*) Entomological	2,25,800 9 8	
			(*c*) White Fly	48,755 6 10	
			(*d*) Root Rot	38,450 5 5	
			(*e*) Spraying Trials	10,812 11 3	
			(*f*) Defibrating and Delinting ..	6,872 10 0	
			(*g*) Survey of Disease of Malformation	1,730 10 6	
			(*h*) Physiological	1,31,133 5 10	
			(*i*) Clean-up Campaign of Spotted Boll-worm	28,799 9 0	
			(*j*) Jassid Investigation	3,101 15 0	
			VII. *Central Provinces* :—		
			(*a*) Botanical	4,71,558 11 9	
			(*b*) Entomological	12,367 15 3	
			VIII. *United Provinces* :—		
			(*a*) Pink Boll-worm	1,47,834 1 4	
			(*b*) Rohilkhand and Bundelkhand Cotton Survey	18,382 10 4	
			IX. Institute of Plant Industry, Indore.	16,55,943 12 0	
			X. Sind	2,62,174 8 11	
			XI. *Burma* :—		
			(*a*) Capital expenditure	2,906 15 5	
			(*b*) Cotton Improvement	47,790 3 9	
Carried forward ..		1,40,49,778 1 0	Carried forward	47,71,637 6 9	66,08,902 13 4

BALANCE SHEET AS AT 31st MARCH 1938—*concld.*

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Brought forward		1,40,49,778 1 0	Brought forward	47,71,637 6 9	66,08,902 13 4
			XII. *Hyderabad :—*		
			(*a*) Botanical	2,83,255 8 4	
			(*b*) Cotton Survey	37,961 0 4	
			(*c*) Pink and Spotted Boll-worm ..	60,238 14 1	
			(*d*) Improvement of Kumpta cotton	2,690 0 0	
			(*e*) Inclusion of Northerns and Westerns in Dry Farming Scheme at Raichur	263 0 0	
			(*f*) Pink and Spotted Boll-worm Clean-up Campaign	9,135 0 0	
			XIII. Bikaner	46,914 15 2	
			XIV. *Baroda :—*		
			(*a*) Root Rot	64,498 14 0	
			(*b*) Comparative Tests	4,251 5 3	
			(*c*) Survey of Goghari cotton ..	3,116 4 0	
			(*d*) Plant Puller Propaganda ..	11,383 11 0	
			XV. Bengal Comilla	13,831 1 3	
			XVI. Mysore Doddahathi	5,731 8 0	
			XVII. Collection of Iran cottons	3,160 0 6	
			XVIII. *Improvement of Dholleras Cottons :—*		
			(*a*) Wagad cottons at Viramgaon.	5,128 2 0	
			(*b*) Mathio cotton at Amreli and Jagudan	2,833 0 0	
			XIX. Preliminary Scheme at Nawanagar.	342 15 4	
			XX. Estimation of effects on cotton crop of use of Plant Puller	3,318 4 0	53,29,690 14 0
					1,19,38,593 11 4
			By Loans recoverable (but considered doubtful) :—		
			1. Hubli Co-operative Cotton Sale Society	6,966 2 0	
			2. Gadag Co-operative Cotton Sale Society	3,514 11 2	10,480 13 2
			By Suspense account		719 1 7
			By Closing Balance		20,99,984 6 11
Grand Total		1,40,49,778 1 0	Grand Total		1,40,49,778 1 0

PROVIDENT FUND ACCOUNT AS ON 31st MARCH 1938.

RECEIPTS.	Rs.	a.	p.	Rs.	a.	p.	EXPENDITURE.	Rs.	a.	p.	Rs.	a.	p.
Subscribers contributions account	2,67,451	6	11				By Advance to subscribers	46,600	10	0			
Less—Payments made to subscribers resigned ..	67,999	15	10				*Less*—Recoveries made up to 31st March 1938 ..	43,106	11	0			
Committee's contributions	2,61,261	8	4	1,99,451	7	1					3,493	15	0
Less—Payments made to subscribers resigned and for forfeitures for Committee's contributions disallowed	65,573	1	2				Accrued interest on Government Paper up to 31st March 1938 credited to subscribers for distribution				4,374	3	0
				1,95,688	7	2	By Balance				4,31,223	12	7
Suspense Deposit of Mr. Dutt's own contribution				1,124	10	9							
Investment Fluctuation account				37,784	9	5							
Lapse and Forfeiture account				2,524	11	5							
Suspense receipts for amounts due to subscribers resigned :—													
1. Mr. Hortwal	433	9	7										
2. „ Shadadpuri	951	14	5										
3. „ Savadkhadker	155	2	5										
4. „ Y. V. Kulkarni	123	8	4	2,518	0	9							
5. Bhai Autarsingh	660	0	7										
6. Siva Rama	193	10	5										
7. Indian Central Cotton Committee % ..	0	3	0										
	2,518	0	9										
TOTAL ..				4,39,091	14	7	TOTAL ..				4,39,091	14	7

INDIAN CENTRAL COTTON COMMITTEE.

Statement of Receipts and Payments for the Year Ended 31st March 1938.

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
*Opening Balance ..	23,96,072 1 10		Administration of the Committee (including Improvement of Cotton Marketing; Seed Distribution and Extension Schemes; Printing and Propaganda; Statistical Research and Travelling Allowance of Non-Official Members)		3,75,741 11 5
Less—Payments of undisbursed pay and other suspense receipts in 1936-37	23 0 0	23,96,049 1 10	Agricultural Research Grants-in-Aid		4,77,146 11 1
			Technological Research		1,91,372 10 8
Receipts under Section 12 of the Indian Central Cotton Cess Act, 1923	6,82,494 4 11		Closing Balance :—		
Less—Refund of Cotton Cess to Burma on Separation	42,369 10 9	6,40,124 10 2	(Government Paper at Cost) 3½% Government of India Loan 1947-50 of the Face Value of Rs. 2,75,000	2,18,032 13 0	
**Other Receipts ..		8,880 13 10	*4% Government of India Loan 1960-70 of the Face Value of Rs. 7,08,900	5,80,153 0 10	
Interest on Investments..		1,10,390 13 0	4½% Government of India Loan 1955-60 of the Face Value of Rs. 26,600	25,004 0 0	
			5% Government of India Loan 1939-44 of the Face Value of Rs. 64,000	35,987 15 6	
			5% Government of India Loan 1940-43 of the Face Value of Rs. 3,60,000	3,98,362 8 0	
			6% Bombay Municipal Bonds 1954 of the Face Value of Rs. 50,000	56,500 0 0	
			6% Karachi Port Trust Coupon Debentures 1956 of the Face Value of Rs. 1,30,000	1,41,212 8 0	
			6% Rangoon Municipal Debentures 1955 of the Face Value of Rs. 3,83,500	4,15,328 2 0	
			3½% Indian Sterling Bearer Bonds of the Face Value of £20,000 ..	2,20,688 14 10	
				20,91,269 14 2	
			(Market Value on 31st March 1938 was Rs. 25,42,487-15-8.)		
			Imperial Bank of India Current Account	4,587 0 9	
Carried forward ..		31,55,445 6 10	Carried forward ..	20,95,856 14 11	10,44,261 1 2

Statement of Receipts and Payments for the Year Ended 31st March 1938—contd.

RECEIPTS.	Rs.	a.	p.	Rs.	a.	p.	EXPENDITURE.	Rs.	a.	p.	Rs.	a.	p.	Rs.	a.	p.
Brought forward ..				31,55,445	6	10	Brought forward ..				20,95,856	14	11	10,44,261	1	2
*Includes Rs. 8,293-2-0 on account of Sinking Fund & Rs. 12,083-12-10 against Loans Recoverable from Hubli & Gadag Co-operative Cotton Sale Societies. **Includes Rs. 1,333-9-0 against Provision for Sinking Fund for the year 1937-38.							*Imprests* :—Committee's Account, as certified by the Secretary	1,500	0	0						
							Imprests :—									
							Technological Laboratory as certified by the Director, Technological Laboratory	500	0	0						
							Director of Agriculture, Bombay Presidency, as certified by the Director of Agriculture, Bombay Presidency	1,550	0	0						
							Director of Agriculture, Punjab, for Cotton Research Botanist's Office, Lyallpur, as certified by the Cotton Research Botanist, Punjab	150	0	0						
							Plant Physiologist, Punjab, as certified by the Plant Physiologist, Punjab	100	0	0						
							Director of Agriculture, Sind, as certified by the Director of Agriculture, Sind	310	0	0						
							Undisbursed pay of Hamal of The Indian Central Cotton Committee's Office..	17	8	0	4,127	8	0			
							Suspense (Recoverable)				719	1	7			
							Loans Recoverable (but considered Doubtful)				10,480	13	2			
							**Total Closing Balance							21,11,184	5	8
							*4% Government of India Loan 1960-70 of the Face Value of Rs. 1,16,900 has been deposited with the Imperial Bank of India for Security against any Overdraft that may be required by the Committee.									
							** Includes Rs. 9,626-11-0 on account of Provision for Sinking Fund.									
TOTAL Rs. ..				31,55,445	6	10	TOTAL Rs. ..							31,55,445	6	10

We have examined the above Statement of Receipts and Payments of The Indian Central Cotton Committee with the Books, Vouchers and Certified Returns of the Committee, have obtained all the informations and explanations we have required and certify that to the best of our information and explanations received, the above Statement is a correct abstract of the figures appearing in the Books and is drawn up in conformity with the Rules under the Indian Cotton Cess Act, 1923.

(Sd.) S. B. BILLIMORIA & Co.,
Registered Accountants, Auditors.

BOMBAY, 3*rd May* 1938.

INDIAN CENTRAL COTTON COMMITTEE.

Provident Fund Account as at 31st March, 1938.

RECEIPTS.	Rs. a. p.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
To Opening Balance as on 1st April, 1937	3,89,859 1 2			By Balance :—		
Less.—Refund to Indian Central Cotton Committee for excess recoveries in 1936-37	1,000 0 0	3,88,859 1 2		(Securities in Government Papers at Market Price.)		
To Subscribers' Contributions	28,052 14 0			3½% Government Promissory Notes of the face value of Rs. 2,35,400	2,29,809 4 0	
Less—Refunds of excess-recoveries	15 7 0			3½% Government of India Loan 1947-50 of the face Value of Rs. 80,500	85,380 5 0	
	28,037 7 0			4% Government of India Loan 1960-70 of the face Value of Rs. 32,600	37,164 0 0	
Add—Recoveries against Advances	5,444 15 0	33,482 6 0		5% Government of India Loan 1939-44 of the Face Value of Rs. 35,600	37,024 0 0	
		4,22,341 7 2		Savings Bank Account with the Imperial Bank of India	5,149 7 0	
Less—Refunds to Subscribers who have resigned	21,074 0 3			Current Account with the Imperial Bank of India	36,696 12 7	
Advances to Subscribers	5,236 11 0	26,310 11 3		*Total Closing Balance		4,31,223 12 7
		3,96,030 11 11				
To Committee's Contributions received from Indian Central Cotton Committee at 100 per cent.		28,037 7 0				
		4,24,068 2 11				
Less—Payments made to Subscribers who have resigned, including transfers to Lapses and Forfeitures Account for contributions disallowed		21,070 6 0				
			4,02,997 12 11			
To Interest received on Investments		14,024 0 8				
To Interest received on Advances to Subscribers		179 10 4				
To Refund of Income-Tax deducted on Interest received during 1936-37		292 9 0				
		14,496 4 0				
Less—Interest paid during the year to Subscribers who have resigned :	Rs. a. p.					
On their own Contributions	115 12 0					
On Committee's Contributions	120 8 2					
Interest paid in advance at the time of purchase of Government Securities (since received)	400 14 6					
Income-Tax deducted from Interest on Investments (Recoverable)	153 11 2					
Bank's Commission for collection of Interest and cost of stamps	57 15 0					
Cost of Stationery, etc.	8 2 0					
		865 14 10				
			13,630 5 2			
Carried forward			4,16,628 2 1	Carried forward		4,31,223 12 7

* Includes Rs. 1,124-10-9 being suspense Deposit with Interest thereon of Mr. Dutt's own Contribution.

Provident Fund Account as at 31st March, 1938—concld.

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Brought forward ..		4,16,628 2 1	Brought forward ..		4,31,223 12 7
Lapses and Forfeiturers Account		498 1 9			
Suspense receipts, amount due to Subscribers resigned but remained unpaid during the year :—					
Mr. Hertwal	433 9 7				
„ Shadadpuri	951 14 5				
„ Savadkhadkar	155 2 5				
„ Y. V Kulkarni	123 8 4				
Bhai Autarsingh	660 0 7				
Siva Rama	193 10 5				
Indian Central Cotton Committee	0 3 0				
		2,518 0 9			
Investment Fluctuation Account :—					
Appreciation in Securities	11,863 14 0				
Less—Loss on redemption at par of 6½% Bombay Improvement Trust Loan	284 6 0				
		11,579 8 0			
TOTAL RS. ..		4,31,223 12 7	TOTAL RS. ..		4,31,223 12 7

BOMBAY, *3rd May*, 1938.

Examined and found correct.
(Sd.) S. B. BILLIMORIA & Co.,
Registered Accountants, Auditors.

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31ST MARCH 1938.

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1938.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
				RESEARCH SCHEMES.					
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
II. *Technological Research*—									
(1) Technological Laboratory:									
(*a*) Capital Expenditure.	5,71,399 3 8		1923	5,61,411 13 10	4,07,988 14 6	1,53,422 15 4	....	....	
(*b*) Working Expenses ..	20,54,352 15 7		Jan. 1924	20,17,159 6 11	....	....	54,483 7 4	19,62,675 15 7	
(2) Provincial :—		Permanent.							
Capital	8,211 0 0		April 1928	1,18,023 6 10	....	*7,682 7 0	....	....	*Provisional figure.
Working	1,10,340 15 10				....	....	340 0 3	1,10,000 15 7	
(3) Development of alternative uses for Indian cottons	40,263 0 0	..	....	10,238 9 11	....	....	....	10,238 9 11	
AGRICULTURAL RESEARCH GRANTS.									
IV. *Bombay Schemes*—									
(1) Surat Physiological and Writing-up	2,91,445 0 0	10 1½	Sept. 1923	2,50,954 2 11	....	....	23,334 5 2	2,27,619 13 9	Physiological scheme closed down on 4th August 1932 and Writing-up scheme on 17th October 1933.
(2) (*a*) Surat Bollworm ..	1,20,720 0 0	7 7	Sept. 1923	1,14,509 9 7	....	....	4,707 8 7	1,09,802 1 0	Scheme closed down on 31st March 1931.
(*b*) Surat Bollworm Writing-up	2,420 0 0	0 4	July 1932	2,315 3 0	....	....	....	2,315 3 0	

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31ST MARCH 1938—*contd.*

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1938.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
				RESEARCH SCHEMES—*contd.*					
IV Bombay Schemes—(contd.)	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
(*c*) Surat Bollworm Propaganda and Clean-up	1,28,764 0 0	4 0	1st April 1931	91,468 9 2	....	....	10,828 0 11	80,640 8 3	
(*d*) Plant Puller Propaganda Scheme in Surat & Broach Districts	32,654 0 0 9,870 0 0	5 0 2 0	March 1934	11,814 7 3	....	....	817 12 6	10,996 10 9	This continuation scheme is financed from the savings of the Surat Clean-up Scheme.
(3) Dharwar :—									
(*a*) Wilt and cotton Breeding	2,63,545 0 0	8 11	Sept. 1923	1,82,836 4 11	....	....	13,713 3 7	1,69,123 1 4	Schemes closed down on 31st July 1932 and in July 1929.
(*b*) Writing-up	11,355 0 0	0 10	1st June 1932	10,902 10 3	....	....	....	10,902 10 3	Scheme closed down on 31st March 1933.
(4) Khandesh Cotton Breeding	27,995 0 0	5 5½	15th Oct. 1926	26,573 5 0	....	....	....	26,573 5 0	Scheme closed down on 31st March 1932.
(5) Co-ordination of Cotton Research	23,991 0 0	..	not started	1,749 7 6	....	....	....	1,749 7 6	
(6) Jalgaon Cotton Breeding.	76,061 0 0	10 0	1st April 1932	45,085 10 3	....	....	3,811 10 6	41,273 15 9	
(7) Broach Cotton Breeding.	1,20,910 0 0	10 0	1st April 1932	56,219 3 8	....	....	6,655 8 4	49,563 11 4	

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1938.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
				RESEARCH SCHEMES—*contd.*					
Bombay Schemes—(contd.)	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
(8) Survey of Small Leaf disease of cotton	5,118 0 0	1 0	6th Nov. 1933	3,938 9 6	....	....	495 2 6	3,443 7 0	Scheme closed down on 31st October 1934.
(9) Survey of Goghari cotton in Gujerat.	5,000 0 0	5 0	16th Jan. 1935	3,352 6 0	....	....	....	3,352 6 0	
(10) Defibration of cotton seed :—									
(*a*) Recurring	5,250 0 0	3 0	1st Feb. 1936	5,568 0 4	....	....	39 10 1	1,830 14 5	
(*b*) Non-Recurring ..	3,700 0 0				....	3,697 7 10	....	....	
(11) Breeding of Wilt Resistant Cottons for Surat Area	14,385 0 0	5 7	1st April 1937	2,511 8 0	....	....	191 6 0	2,320 2 0	
(12) Cotton Wilt Breeding Scheme, Poona ..	42,350 0 0	5 0	1st April 1937	10,226 10 0	....	....	4,065 15 11	6,160 10 1	
(13) Inclusion of Northerns and Westerns in Dry Farming Scheme at Bijapur.	7,908 0 0	4 0	1st June 1937	1,466 14 9	....	....	519 7 3	947 7 6	
(14) Interspecific Hybridisation in cottons at Surat	14,014 0 0	5 0	....	....	....	....	....	....	
V. *Madras* :—									
(*a*) Herbaceum	1,47,068 0 0	14 6	1st Dec. 1923.	1,40,409 12 6	....	....	4,431 7 0	1,35,978 5 6	Scheme closed down on 31st May 1938.
(*b*) Pempheres and Physiological	2,12,779 0 0	7 0 3 0	16th Sept. 1931.	1,38,152 2 10	....	....	8,091 6 0	1,30,060 12 10	

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31ST MARCH 1938—*contd.*

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1938.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
				RESEARCH SCHEMES—*contd.*					
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
(*c*) Fodder Cholam :—									
i. Capital	900 0 0	6 5	14th Jan. 1931	19,517 9 4	....	881 11 7	....	....	
ii. Recurring	21,010 0 0				....	....	291 3 4	18,344 10 5	Scheme closed down on 14th June 1937.
(*d*) Nadam Cotton Breeding.	18,203 0 0	8 0	14th June 1933	11,509 6 8	....	....	411 12 9	11,097 9 11	
(*e*) Improvement of Mungari cotton	23,534 0 0	5 0	24th May 1937	362 0 0	....	....	78 10 8	283 5 4	
VI. *Punjab* :—									
(*a*) Botanical—									
(i) Capital	31,330 0 0	14 7½	13th Aug. 1925	5,24,097 11 1	22,158 0 0	9,102 11 0	....	....	
(ii) Working Expenses ..	*6,85,650 0 0				....	....	34,483 13 3	4,58,353 2 10	*Rs. 2,030 transferred to capital.
(*b*) Entomological :—									
i. Capital	6,000 0 0	11 11	4th May 1926	2,25,800 9 8	....	5,826 3 10	....	....	
ii. Working Expenses (Pink and Spotted Bollworm)	2,49,646 0 0				....	....	10,468 2 11	2,09,506 2 11	Scheme closed down on 31st March 1938.
(*c*) White fly	56,087 0 0	5 5	1st May 1931	48,755 6 10	....	....	8,866 6 0	39,889 0 10	Scheme closed down on 30th September 1936.
(*d*) Root Rot :—									
(i) Non-Recurring ..	3,000 0 0	8 6	1st Sept. 1932	38,450 5 5	....	....	300 8 9	38,149 12 8	
(ii) Recurring	63,391 0 0								
(*e*) Spraying Trials	14,400 0 0	..	8th July 1933	10,812 11 3	....	....	2,402 15 9	8,409 11 6	
(*f*) Physiological (Cotton Failure Research) ..	2,36,348 0 0	5 0	15th March 1935	1,31,133 5 10	....	....	15,354 4 7	1,15,779 1 3	

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1938.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
				RESEARCH SCHEMES—*contd.*					
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
(*g*) Clean-up Campaign ..	52,580 0 0	2 0	1st April 1937	28,799 9 0	....	....	9,599 6 8	19,200 2 4	
(*h*) Defibrating & Delinting: Recurring	1,000 0 0	2 0	....	6,872 10 0	....	....	17 12 0	982 4 0	
Non-Recurring	6,700 0 0				....	5,872 10 0	....	....	
(*i*) Survey of disease of malformation	2,674 0 0	0 10	1st June 1934	1,730 10 6	....	....	....	1,730 10 6	Scheme closed down on 31st March 1935.
(*j*) Cotton Jassid Investigation	10,225 0 0	3 0	1st April 1937	3,101 15 0	....	....	151 15 0	2,950 0 0	
(*k*) Improvement of Punjab American 289F Cotton.	14,000 0 0	5 0	9th July 1938	....	....	....	....	....	
VII. Central Provinces :—									
(*a*) Botanical	*61,000 0 0	2 6	October 1923	4,71,558 11 9	....	....	5,118 15 4	4,66,439 12 5	*The balance of this amounting to Rs. 3,400–13–5 lapsed on revision.
	5,36,150 0 0	13 0	1st April 1926						
	*68,292 0 0	5 0							*Subject to Government of India's sanction.
(*b*) Entomological	13,131 0 0	3 3	2nd July 1934	12,367 15 3	....	....	59 10 6	12,308 4 9	Scheme closed down on 30th September 1937.
(*c*) Investigation of Heliothis Obsoleta	3,000 0 0	1 0	not started	....	....	....	....	....	

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1938.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
				RESEARCH SCHEMES—*contd.*					
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
VIII. United Provinces :—									
(*a*) Pink Bollworm :—									
i. Capital ..	54,000 0 0	8 0	July 1923	1,47,834 1 4	....	49,511 5 6	....	....	Scheme closed down on 31st July 1931.
ii. Working Expenses ..	56,000 0 0				....	....	3,065 4 3	95,257 7 7	
iii. Recurring grant for Staff	44,475 0 0	7 9½	1st Oct. 1926						Scheme closed down on 12th July 1934.
(*b*) Rohilkhand & Bundelkhand Cotton Survey.	19,000 0 0	3 8	1st July 1933	18,382 10 4	....	....	1,529 12 1	16,852 14 3	Scheme closed down on 1st March 1937.
(*c*) Botanical	91,380 0 0	5 0	....	....	....	....	....	....	
IX. Institute of Plant Industry, Indore :—									
(*a*) Capital	†2,83,535 12 10	Permanent.	October 1924.	16,55,943 12 0	2,12,552 11 5	70,983 1 5	....	....	†Rs.50,202-12-10 transferred from recurring grant to capital.
(*b*) Working Expenses ..	13,72,407 15 2				....	....	31,857 4 4	13,40,550 10 10	
X. Sind :—									
(i) Physiological	2,74,346 0 0	11 4	10th July 1927	2,62,174 8 11	....	....	17,370 11 9	2,44,803 13 2	Scheme closed down on 30th June 1937.
(ii) Jassid Investigation ..	11,261 0 0	3 6	9th May 1938	....	....	....	....	....	
(iii) Investigation into Black-headed Cricket. ..	13,980 0 0	3 0	....	....	....	....	....	....	
XI. Burma :—									
(*a*) Capital	3,000 0 0	..	....	2,906 15 5	....	2,906 15 5	....	....	
(*b*) Cotton Improvement ..	49,032 0 0	6 0	1st April 1931	47,790 3 9	....	....	4,234 5 0	43,555 14 9	Scheme closed down on 31st March 1937.

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31ST MARCH 1936—*contd.*

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1938.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
				RESEARCH SCHEMES—*contd.*					
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
XII. Hyderabad :—									
(*a*) Botanical	4,88,769 0 0	14 11	10th May 1929	2,83,255 8 4	....	....	‡20,165 14 0	‡2,63,089 10 4	‡Provisional figure.
(*b*) Cotton Survey	39,165 0 0	5 0	28th June 1931	37,961 0 4	....	....	187 11 10	37,773 4 6	Scheme closed down on 27th June 1936.
(*c*) Pink & Spotted Bollworm & Clean-up Campaign	1,21,600 0 0	6 4	1st June 1933	69,373 14 1	....	....	653 14 0	68,720 0 1	
(*d*) Improvement of Kumpta cotton	32,542 0 0	5 0	28th Nov. 1937	2,690 0 0	....	....	§109 0 0	2,581 0 0	§Provisional figure.
(*e*) Inclusion of Northerns & Westerns in Dry Farming Scheme at Raichur.	1,723 0 0	4 0	1st Sept. 1937	263 0 0	....	....	....	263 0 0	
XIII. Bikaner—Bengals Cotton Improvement :—									
(*a*) Capital	14,500 0 0	10 0	1st Jan. 1931	46,914 15 2	8,584 6 9	3,873 13 3	....	....	
(*b*) Working	65,320 0 0				....	....	1,263 6 0	33,193 5 2	
XIV. Baroda :—									
(*a*) Root Rot—									
i. Capital	4,000 0 0	..	....	64,498 14 0	3,046 1 6	....	....	....	
ii. Recurring Expenses ..	91,569 0 0	10 4	1st Feb. 1932		....	....	5,442 3 4	56,010 9 2	
(*b*) Comparative tests of 1027 and I-A cottons ..	4,280 0 0	1 2	1st April 1932	4,251 5 3	....	....	145 11 6	4,105 9 9	Scheme closed down on 15th June 1933.
(*c*) Survey of Goghari Cotton.	5,000 0 0	5 0	1st Feb. 1935	3,116 4 0	....	....	....	3,116 4 0	
(*d*) Plant Puller Propaganda.	27,633 0 0	4 0	1st Jan. 1936	11,383 11 0	....	....	....	11,383 11 0	

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31ST MARCH 1938—*contd.*

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1938.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
				RESEARCH SCHEMES—*contd.*					
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
XV. Bengal Comilla Cotton.	18,540 0 0	5 0	1st Dec. 1934	13,831 1 3	....	....	967 11 4	12,863 5 11	
XVI. Mysore (Doddahathi) Cotton	18,416 0 0	6 0	1st Nov. 1935	5,731 8 0	....	....	83 6 0	5,648 2 0	
XVII. Collection of Herbaceum Cottons in Iran.	4,000 0 0	..	31st Aug. 1936	3,160 0 6	....	....	....	3,160 0 6	
XVIII. Improvement of Dholleras :—									
(*a*) Preliminary trials at Nawanagar ..	900 0 0	0 4	1st June 1936	342 15 4	....	....	....	342 15 4	
(*b*) Wagad cotton at Viramgam	27,110 0 0	5 0	1st May 1937	5,128 2 0	....	....	1,275 0 11	3,853 1 1	
(*c*) Mathio cotton at Amreli and Jagudan.	21,570 0 0	5 0	4th June 1937	2,833 0 0	....	....	331 3 7	25,01 12 5	
XIX. Estimation of effects on cotton crop of use of Plant Pullers ..	4,738 0 0	2 0	1st Dec. 1936	3,318 4 0	....	....	2 4 0	3,316 0 0	
XX. Marketing Schemes— (*a*) Marketing of 1027 ALF. Cotton of Baroda State	7,326 0 0	3 0	1st Feb. 1938.	....	....	....	....	....	
(*b*) Cotton Marketing Survey in the Punjab.	6,719 0 0	1 3	not started	....	....	....	....	....	

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31ST MARCH 1938—*contd.*

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1938.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
				SEED SCHEMES.					
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
1. *Bombay Presidency* :—									
i. Hubli	50,110 0 0	6 0	June 1930	44,065 9 3	....	....	5 14 0	44,059 11 3	Schemes closed down on 31st May 1936.
ii. Gadag	54,545 0 0	6 0	June 1930	41,706 11 1	....	....	....	41,706 11 1	
iii. Gadag Supplementary ..	21,448 0 0	4 0	10th June 1931	20,167 11 4	....	....	2,929 5 6	17,238 5 10	Scheme closed down on 10th June 1935.
iv. Haveri	27,752 0 0	5 0	....	....	....	....	....	....	Scheme did not start.
v. Athani	46,757 0 0	5 0	5th April 1932	18,086 1 7	....	....	1,722 15 6	16,363 2 1	Scheme closed down on 31st May 1936.
vi. Bailhongal	27,425 0 0	5 0	....	....	....	....	....	....	Scheme did not start.
vii. Surat	96,050 0 0	9 0	1st April 1930	63,006 15 10	....	....	....	63,006 15 10	
viii. Khandesh (Banilla) ..	2,70,340 0 0 20,787 0 0	5 0 1 0	1st May 1931	1,63,393 13 6	....	....	9,032 14 0	1,54,360 15 6	Receipts amounting to Rs. 1,10,000, are anticipated in the scheme. The grant of Rs. 20,787, for the extended period takes into account anticipated receipts amounting to Rs. 6,000. This scheme closed down on the 30th April 1937.
ix. Khandesh (Jarila) ..	24,828 0 0	1 10	1st May 1937	12,075 0 0	....	2,970 0 0	605 12 6	8,499 3 6	Excludes anticipated receipts amounting to Rs. 6,500.

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31ST MARCH 1938—*contd.*

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1938.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, i.e., staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
				SEED SCHEMES—*contd.*					
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
x. Deccan Canals (Banilla).	24,465 0 0	5 0	1st April 1934	—252 8 7	....	....	111 1 6	....	This scheme is self supporting due to the anticipated receipts.
xi. B. D. 8	~~10,460~~ 0 0 A 37,041 0 0	3 0 5 0	1st Dec. 1935	6,540 7 0	....	....	335 13 6	6,204 9 6	A Government of India's sanction awaited.
xii. Revised Jayawant and Gadag No. 1	2,66,772 0 0	5 0	1st June 1936	43,969 10 11 15,327 5 6	....	....	1,854 7 0 160 13 0	42,115 3 11 15,166 8 6	This grant is subject to the condition that the Bombay Government bears 25% of the net cost calculated after deducting total savings under the Hubli, Gadag, Athani, Haveri and Bailhongal schemes.
xiii. Maintenance of nucleus of pure seed of improved varieties of cotton.	13,300 0 0	5 0	Sept. 1937	2,320 0 0	....	....	14 12 0	2,305 4 0	
2. *Madras Presidency :—*									
i. Pay and allowance of Business Manager, Tirupur.	24,940 0 0	6 4	18th May 1931	24,264 2 3	....	....	162 4 0	24,101 14 3	Scheme closed down on 17th August 1937.
ii. Co. 2	81,310 0 0	6 0	15th Sept. 1932	40,836 15 3	....	....	83 13 0	40,753 2 3	Scheme closed down on 17th August 1937 and recommenced work from 19th Oct. 1938 for one year's extension.

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31st MARCH 1938.

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1938.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
				SEED SCHEMES—*contd.*					
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
iii. H. 1.	18,860 0 0	2 0	6th May 1933	3,952 2 9	....	....	....	3,952 2 9	Scheme closed down on 16th July 1934.
iv. Maintenance of nucleus of pure seed of improved varieties of cotton ..	3,050 0 0	5 0	....	....	....	....	....	....	
3. Punjab Lyallpur Ginnery ..	18.125 0 0	..	....	16,038 3 3	9,221 5 0	6,816 14 3	....	....	
4. *Sind* :—									
i. Seed Distribution and Extension scheme	3,89,540 0 0	8 0	1st April 1931	3,02,606 0 10	....	....	6,832 13 6	2,95,773 3 4	
ii. Maintenance of nucleus of pure seed of improved varieties of cotton ..	12,500 0 0	5 0	1st April 1938	....	....	....	....	....	
iii. Financing of seed distribution	1,35,000 0 0	3 0	....	....	....	....	....	....	To start from 1939-40.
5. Hyderabad State—Seed Distribution and Extension Scheme	35,466 0 0 *b.* 25,799 0 0	6 6 4 6	1st March 1930	33,167 12 1	....	....	....	33,167 12 1	*Provisional figure *b*. The amount represents the Committee's share of expenditure which is borne on 50 : 50 basis between the Hyderabad State and the Committee.

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31ST MARCH 1938.—*contd.*

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1938.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
				SEED SCHEMES—*contd.*					
6. *Central Provinces :—*									
i. Verum cotton	1,17,900 0 0	3 8	1st Sept. 1930	73,544 2 5	....	....	....	73,544 2 5	Scheme closed down on 30th April 1934.
ii. Extension of long staple cotton and marketing of Verum cotton (new nomenclature from 1st March 1939—Extension and Marketing of V. 434.)	*a* { 2,18,819 0 0 / 33,725 0 0 }	{ 5 2½ / 3 0 }	1st April 1934	1,49,726 0 0	....	....	330 0 0	1,49,396 0 0	
iii. Distribution and Marketing of Buri 107 cotton in Burhanpur Tahsil ..	*a* 15,300 0 0	3 0	....	....	....	....	....	....	*a* Government of India's sanction is awaited.
iv. Maintenance of nucleus of pure seed of improved strains of cotton ..	*a* 7,000 0 0	5 0	....	....	....	....	....	....	
7. *Baroda State :—*									
i. Seed Distribution and Extension Scheme	{ 25,600 0 0 / *a* 29,888 0 0 }	{ 5 0 / 5 0 }	16th April 1934	12,036 6 5	....	....	*117 8 0	11,918 14 5*	*Provisional figure.
ii. B. D. 8	*a* 17,300 0 0	5 0	....	....	....	....	....	....	
8. United Provinces C. 402 ..	45,800 0 0	5 0	1st May 1935	19,198 7 0	....	....	300 0 0	18,898 7 0	Closed down on 15th February 1938.

APPENDIX XVII.

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1938.

	INDIAN CENTRAL COTTON COMMITTEE.		
1.	Secretary	Mr. D. N. Mahta, B.A. (Oxon.). F.L.S. ..	——
2.	Assistant Secretary	Mr. C. J. Bocarro, M.A.	——
	TECHNOLOGICAL LABORATORY, BOMBAY.		
3.	Director	Dr. Nazir Ahmad, M.Sc., Ph. D. (Cantab.), F. Inst. P.	Late Head of Science Department, Islamia College, Lahore.
4.	Senior Research Assistant (Chemist) ..	Mr. D. L. Sen, M. Sc., Tech. (Manch.), M.Sc. (Bom.), A.I.I. Sc., F.I.C.	Research Student at the Indian Institute of Science and Manchester College of Technology.
5.	Senior Research Assistant (Physicist) ..	Mr. N. Hari Rao, M.Sc. (Calcutta)	Research Scholar, Technological Laboratory (Textile Physics).
6.	Senior Research Assistant (Physicist) ..	Mr. Ram Saran Koshal, M.Sc. (Punjab) ..	Do. do.
7.	Spinning Master	Mr. V. V. Gupte, B.Sc., (Tech.)	——
8.	Junior Research Assistant (Microscopist) ..	Mr. Amar Nath Gulati, M.Sc. (Punjab) ..	Imperial Institute of Veterinary Research, Mukteswar, U.P.
9.	Statistician and Personal Assistant	Mr. V. Venkataraman, M.A. (Madras)	Statistical Assistant, Labour Office, Govt. of Bombay, Bombay.
10.	Junior Research Assistant (Physicist) ..	Mr. C. Nanjundayya. M. Sc. (Calcutta).. ..	Research Scholar, Technological Laboratory (Textile Physics).
11.	Senior Tester	Mr. H. B. Joshi, B.Sc.	——
12.	Senior Tester	Mr. S. S. Sukthanker, L.T.C. (V.J.T.I.) ..	——

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1938—*contd.*

TECHNOLOGICAL LABORATORY, BOMBAY—*contd.*

13.	Junior Tester	Mr. G. D. Bhide, B.Sc.	——
14.	Junior Tester	Mr. K. V. N. Nayar	——
15.	Junior Tester	Mr. V. N. Modak, B.Sc.	——
16.	Junior Tester	Mr. L. V. Sundararaman, B.A.	——
17.	Junior Tester	Mr. P. S. Sambamurthy	——
18.	Junior Tester	Mr. R. G. Panvalkar, B.Sc.	——
19.	Junior Tester	Mr. G. J. Kharkar, B.Sc.	——
20.	Junior Tester	Mr. A. J. Farid	——
21.	Junior Tester	Mr. P. V. Nachane, B.Sc.	——
22.	Junior Tester	Mr. S. Samson, B.Sc.	——
23.	Junior Tester	Mr. C. S. Ramanathan, B.Sc.	——
24.	Junior Tester	Mr. B. N. Prabhakar, B.Sc.	——
25.	Junior Tester	Mr. S. M. Nawaz, B.Sc.	——
26.	Statistical Clerk	Mr. R. Krishna Iyer	——
27.	Statistical Clerk	Mr. P. K. Wagle	——
28.	Electrician	Mr. H. Lobo, L. E. E. (V.J.T.I.).	——
29.	Spinning Assistant	Mr. N. Iyengar	——
30.	Draughtsman	Mr. B. G. Mehta	——
31.	Mechanic	Mr. J. B. Kharas	——

INSTITUTE OF PLANT INDUSTRY, INDORE.

32.	Director	Mr. T. R. Low, B.Sc., (Agri.) (London), I.A.S.	Principal, Agricultural College, Cawnpore. On deputation from the United Provinces Department of Agriculture.
33.	Geneticist and Botanist	Mr. K. Ramiah, L.Ag., M.Sc. Dip. Agri. (Cantab.)	Paddy Specialist to the Madras Government. On deputation from the Madras Department of Agriculture.
34.	Chemist and Agronomist	Mr. Y. D. Wad, M.A., M.Sc. (Bombay), A.I.I.Sc.	Research Student, Indian Central Cotton Committee.
35.	Head Assistant, Chemistry and Agronomy Section.	Mr. A. Sreenivasan, M. A., D.Sc. (Madras) A.I.C.	Research Biochemist in I.C. A.R. Scheme (Bangalore).
36.	Farm Superintendent	Mr. G. C. Tambe, B.Ag. (Bombay)	——
37.	Extension Officer	Mr. Kuber Singh, B.Ag. (Bombay)	——
38.	Assistant Farm Superintendent	Mr. S. C. Talesara, B.Ag. (Bombay)	Research Student, Indian Central Cotton Committee.
39.	Personal Assistant	Mr. A. N. Srivastava, M.Sc. (Lucknow) ..	——
40.	Statistician	Mr. V. G. Panse, B.Sc. (Bombay)	——
41.	Genetical Assistant	Mr. Bholanath, M.Sc. (Punjab)	Research Student, Indian Central Cotton Committee.
42.	Plant Breeding Assistant	Mr. C. P. Dutt, M.Sc. (Calif.)	——
43.	Seed Extension Officer	Mr. K. M. Simlote, B.Ag. (Nagpur)	——
44.	Botanical Assistant	Mr. P. D. Gadkari, M.Sc. (Nagpur)	King Edward Memorial Inland Research Scholar at I.P.I.
45.	Second Plant Breeding Assistant	Mr. M. A. A. Ansari, M.Sc. (Lucknow) ..	Research Student, Institute of Plant Industry, Indore.

INSTITUTE OF PLANT INDUSTRY, INDORE—*contd.*

46.	Extra Assistant in Genetics and Botany Section.	Mr. K. N. Ambegaonkar, M.Sc. (Benares) ..	Research Student, Institute of Plant Industry, Indore.	
47.	Agronomical Assistant	Mr. V. N. Bhargava, B.Sc. (Allahabad) ..	Do.	do.
48.	Analytical Assistant	Mr. L. N. Desai, B.Sc. (Agra)	——	
49.	Analytical Assistant	Mr. S. J. Ghose, B.Sc. (Calcutta)	——	
50.	Physical Chemistry Assistant	Mr. P. M. Salvekar, B.Sc. (Bombay)	——	
51.	Biochemical Assistant	Mr. Y. Subba Rao, B.Sc. (Mysore) B.Ag. (Bombay.)	——	
52.	Statistical Assistant	Mr. G. K. Sant, B.Sc. (Agra)	——	
53.	Artist	Mr. J. S. Oncar	——	

BOMBAY RESEARCH SCHEMES.

(*i*) *Broach Cotton Breeding Scheme.*

54.	Cotton Breeder	Mr. P. L. Patel, M.Sc. (Iowa, U.S.A.)	——	
55.	Botanical Assistant	Mr. S. J. Patel, M.Ag. (Bombay)	On deputation from Bombay Department of Agriculture.	

(*ii*) *Jalgaon Cotton Breeding Scheme.*

56.	Botanical Assistant	Mr. T. R. Khadilkar, M.Ag.	Do.	do.
57.	Botanical Assistant	Mr. S. N. Deshpande, B.Sc. (Agri.) Bombay ..	——	

BOMBAY RESEARCH SCHEMES—*contd.*

(iii) Poona Cotton Wilt Breeding Scheme.

58.	Pathological Assistant	Mr. J. D. Ranadive, B.Ag. (Bombay)	Research Student, Indian Central Cotton Committee.	
59.	Pathological Assistant	Mr. Y. S. Kulkarni, B.Ag. (Bombay)	——	

(iv) Cotton Wilt Breeding Scheme for Surat Area.

60.	Agricultural Overseer	Mr. S. P. Shah, B.Ag. (Bombay)	——	

(v) Dholleras—Wagad Cotton Breeding Scheme, Viramgam.

61.	Agricultural Overseer	Mr. R. J. Naik, M.Ag. (Bombay)	On deputation from Bombay Department of Agriculture.	

BOMBAY SEED DISTRIBUTION SCHEMES.

(i) Surat Scheme.

62.	Cotton Assistant	Mr. V. D. Desai, Matric.	Do.	do.
63.	Cotton Assistant	Mr. V. V. Patel, B.Ag. (Bombay)	Do.	do.

(ii) Khandesh (Jarita) Scheme.

64.	Superintendent, Bhadgaon Farm	Mr. H. U. Vora, B.Ag.	Do.	do.
65.	Cotton Supervisor	Mr. R. B. Nimbalkar, B.Ag. (Bombay)	Do.	do.

(iii) B. D. 8 Scheme.

66.	Agricultural Overseer	Mr. D. A. Dave, B.Ag. (Bombay)	——	

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1938—*contd.*

BOMBAY SEED DISTRIBUTION SCHEMES—*contd.*

(iv) Jayawant and Gadag No. 1 Scheme.

67.	Agricultural Overseer	Mr. B. S. Patil, B.Ag. (Bombay)	——
68.	Agricultural Overseer	Mr. B. M. Dhumma, B.Ag. (Bombay)	——
69.	Agricultural Overseer	Mr. B. S. Tadsur, (B.Ag.) (Bombay)	——
70.	Agricultural Overseer	Mr. D. V. Hiremath, B.Ag. (Bombay)	——
71.	Agricultural Overseer	Mr. S. M. Tippashetti, B.Ag. (Bombay) ..	——
72.	Agricultural Overseer	Mr. S. F. Chandrannavar, B.Ag. (Bombay) ..	Worked as District Supervisor in the Economic Enquiry Scheme.
73.	Agricultural Overseer	Mr. S. T. Aralelimath, B.Sc. (Ag.)	——

BOMBAY COTTON FORECAST IMPROVEMENT SCHEME.

74.	Provincial Officer	Mr. G. R. Ambekar, School Final	On deputation from Bombay Department of Agriculture.

SIND JASSID INVESTIGATION SCHEME.

75.	Research Assistant	Mr. M. S. Patel, B.Ag. (Bombay)	Formerly Research Assistant, Surat Bollworm Scheme and C. P. Entomological Scheme.

SIND SEED DISTRIBUTION SCHEME.

76.	Cotton Supervisor, Indus Left Bank ..	Mr. H. A. Idnani, B.Ag. (Bombay)	Research Student, Indian Central Cotton Committee, on deputation from Sind Department of Agriculture.
77.	Cotton Supervisor, Indus Right Bank ..	Mr. W. P. Shahani, B.Ag. (Bombay)	On deputation from Sind Department of Agriculture.
78.	Senior Assistant to Cotton Supervisor, Indus Left Bank.	Mr. A. R. Arain, B.Ag. (Bombay), C.H.D. (Manchester). ..	——

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1938—*contd.*

SIND SEED DISTRIBUTION SCHEME—*contd.*

79.	Senior Assistant to Cotton Supervisor, Indus Right Bank.	Mr. Agha Khan Mahomed, 2 years' Course. Lyallpur	On deputation from Sind Department of Agriculture.
80.	Junior Assistant to Cotton Supervisor, Indus Right Bank.	Mr. Lekhraj Parmanand	Do. do.
81.	Junior Assistant to Cotton Supervisor, Indus Right Bank.	Mr. W. R. Shahani, F. Y. A.	——
82.	Junior Assistant to Cotton Supervisor, Indus Right Bank.	Mr. Gulshah, U. B.	On Deputation from Sind Department of Agriculture.
83.	Junior Assistant to Cotton Supervisor, Indus Right Bank.	Mr. S. A. Siddiki, B.Ag. (Dip.)	——
84.	Junior Assistant to Cotton Supervisor, Indus Right Bank.	Mr. P. H. Bhavnani	——
85.	Junior Assistant to Cotton Supervisor, Indus Left Bank.	Mr. A. H. Rijhvani, B.Sc. (Agri.), Bombay ..	——
86.	Junior Assistant to Cotton Supervisor, Indus Left Bank.	Mr. R. M. Ranji, Dip.Ag. (Bombay)	Ten years under Sind Physiological Scheme.
87.	Junior Assistant to Cotton Supervisor, Indus Left Bank.	Mr. Tharumal, K. S.	On deputation from Sind Department of Agriculture.
88.	Junior Assistant to Cotton Supervisor, Indus Left Bank.	Mr. Naraindas, T. T.	——
89.	Junior Assistant to Cotton Supervisor, Indus Left Bank.	Mr. S. M. Khalsa, B.Ag. (Bombay)	——
90.	Junior Assistant to Cotton Supervisor, Indus Left Bank.	Mr. Premsing T. Advani	——
91.	Junior Assistant to Cotton Supervisor, Indus Left Bank.	Mr. Lachmandas, M. S.	——

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1938—*contd.*

CENTRAL PROVINCES RESEARCH SCHEME.

Botanical Scheme.

92.	Offg. Economic Botanist for Cotton ..	Mr. S. S. Pande, M.Sc. (Punjab)	Research Student, Indian Central Cotton Committee.	
93.	Assistant to Economic Botanist for Cotton	Mr. S. C. Roy, L.Ag., and Post-Graduate, Pusa.	On deputation from Central Provinces Department of Agriculture.	
94.	Assistant to Economic Botanist for Cotton	Mr. D. G. Sawargaonkar, L.Ag. (Hons.) ..	On deputation from Central Provinces Department of Agriculture.	
95.	Assistant to Economic Botanist for Cotton	Mr. D. Y. Bhand, L.Ag. (Hons.)	Do.	do.
96.	Assistant to Economic Botanist for Cotton	Mr. V. N. Paranjpe, B.Sc. (Allahabad) ..		——

COMBINED LONG-STAPLE COTTON AND MARKETING OF VERUM COTTON SCHEMES IN C. P. AND BERAR.

97.	Agricultural Assistant	Mr. J. P. Tiwari, B.Ag.		——
98.	Agricultural Assistant	Mr. L. P. Khare, B.Ag.		——
99.	Agricultural Assistant	Mr. K. S. S. Chowhan, B.Ag.		——
100.	Agricultural Assistant	Mr. G. N. Wardadkar, B.Ag.		——
101.	Agricultural Assistant	Mr. L. B. Deshpande, B.Ag.		——
102.	Agricultural Assistant	Mr. N. B. Chinchholkar, B.Ag.		——
103.	Agricultural Assistant	Mr. G. C. Tiwari, Certificate Course of Agricultural College, Nagpur.		——
104.	Agricultural Assistant	Mr. M. D. Anadeo, B.Ag.		——
105.	Agricultural Assistant	Mr. Rafat Ali Haqqani, B.Ag.		——

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1938—*contd.*

COMBINED LONG-STAPLE COTTON AND MARKETING OF VERUM COTTON SCHEMES IN C. P. AND BERAR—*contd.*

106.	Agricultural Assistant	Mr. R. S. Shiwalkar, B.Ag.	——	
107.	Agricultural Assistant	Mr. V. S. Hingankar, B.Ag.	——	
108.	Agricultural Assistant	Mr. T. N. Puranik, B.Ag.	——	
109.	Agricultural Assistant	Mr. Gajraj Singh, B.Ag.	——	

MADRAS RESEARCH SCHEMES.

(*i*) *Pempheres and Physiological Scheme.*

110.	Bio-Chemist	Dr. S. Kasinatha Ayyar, B.A., Ph.D. (London)	On deputation from Madras Department of Agriculture.	
111.	Physiological Botanist	Mr. T. R. Narayana Ayyar, B.A. (Cantab.), B.Sc. (Ag.).	Do.	do.
112.	Parasitologist	Mr. P. N. Krishna Ayyar, B.A.	Do.	do.
113.	Assistant Botanist	Mr. K. Dharma Rajulu, M.Sc. (Bombay)	Research Student, Indian Central Cotton Committee.	
114.	Assistant Botanist	Mr. G. Sheshadri Ayyangar, M.A.	——	
115.	Assistant Botanist	Mr. V. Ramaswami Mudaliar, B.A.	——	
116.	Assistant Entomologist	Mr. V. Margabandu, M.A.	On deputation from Madras Department of Agriculture.	
117.	Assistant Entomologist	Mr. P. S. Narayanaswamy, B.Sc. (Ag.)	Do.	do.
118.	Assistant Chemist	Mr. K. Saptharishi, B.Sc. (Ag.)	Do.	do.

(*ii*) *Breeding of Nadam Cotton.*

119.	Assistant	Mr. R. Krishnamurthi, B.Sc. (Ag.)	On deputation from Madras Department of Agriculture.	

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1938—*contd.*

MADRAS RESEARCH SCHEMES—*contd.*

(*iii*) *Mungari Breeding Scheme.*

120.	Assistant	Mr. V. K. Subramanya Mudaliar, L.Ag. ..	On deputation from Madras Department of Agriculture.	

PUNJAB RESEARCH SCHEMES.

(*i*) *Botanical Scheme.*

121.	Cotton Research Botanist	Mr. Mohammad Afzal, B.Sc. (Agri.) (Punjab), A.I.C.T.A. (Trinidad).	Research Student, Indian Central Cotton Committee, and State Research Scholar. On deputation from Punjab Department of Agriculture.	
122.	Assistant to Cotton Research Botanist	..Chaudhri Mohammad Akbar, L.Ag.	On deputation from Punjab Department of Agriculture.	
123.	Extra Asistant Director of Agriculture (Cotton).	Bh. Sarup Singh, L.Ag., M.Sc. (Texas), U.S.A.	Do.	do.
124.	Agricultural Assistant	S. Kehr Singh, B.Sc. (Agri.)	Do.	do.
125.	Agricultural Assistant	Bh. Autar Singh, B.Sc. (Agri.)	Do.	do.
126.	Agricultural Assistant	Bh. Santokh Singh, B.Sc. (Agri.)	Do.	do.
127.	Agricultural Assistant	S. Fateh Ali Shah, B.Sc. (Agri.)	Do.	do.
128.	Agricultural Assistant (B Class)	Ch. Mohammad Rashid Khan, L.C. (Course), Munshi Fazil (F.A., Punjab University).	Do.	do.
129.	Agricultural Assistant (A Class)	Mr. S. E. Daniel, L. C. (Course)	Do.	do.
130.	Agricultural Assistant (A Class)	Mr. Satya Prakash Kohli, B.Sc. (Agri.) ..		——

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31st, 1938—*contd.*

PUNJAB RESEARCH SCHEMES—*contd.*

		(*i*) *Botanical Schemes*—contd.		
131.	Agricultural Assistant (B. Class)	Mr. Sikandarlal Sehgal, B.Sc. (Agri.)	On deputation from Punjab Agricultural Department.	
132.	Statistical Assistant	Mr. Bhagat Ram Sehgal, M A. (Punjab) ..	——	
		(*ii*) *Scheme for Clean-up Campaign of Spotted Bollworm.*		
133.	Agricultural Assistant	Pt. Ganda Ram, B.Sc., F.E.L.	——	
134.	Agricultural Assistant	Mr. Ladha Ram, B.Sc.	——	
135.	Agricultural Assistant	Mr. Manzoor Abbas, B.Sc. (Agri.)	——	
		(*iii*) *Root Rot Scheme.*		
136.	Assistant Cotton Mycologist	Dr. R. S. Vasudeva, B.Sc., Ph.D. (London), D.I.C. (London),	——	
137.	Agricultural Assistant	Mr. Mohd. Ashraf, B.Sc. (Agri.)	——	
138.	Agricultural Assistant	Ch. Mohd. Rafiq, M.Sc. (Hons.)	——	
		(*iv*) *Physiological (Periodical Partial Failure) Scheme.*		
139.	Plant Physiologist	Prof. R. H. Dastur, M.Sc., F.L.S.	On deputation from Bombay Educational Department.	
140.	Assistant Physiologist	Dr. S. S. Verma, D.Sc. (Madras), Ph.D. (London), D.I.C.	Research Student, Indian Central Cotton Committee.	
141.	Bio-Chemist	Dr. K. M. Samant, M.Sc., Ph.D.	——	
142.	Soil Assistant	Dr. A. M. Shaikh, M.Sc. (Bombay), Ph.D. (London), D.I.C., A.I.C.	——	

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31st, 1938—*contd.*

PUNJAB RESEARCH SCHEMES—*contd.*

(iv) Physiological (Periodical Partial Failure) Scheme—contd.

143.	Research Assistant	Dr. J. J. Chinoy, M.Sc. (Bombay), Ph.D. (London), D.I.C.	——
144.	Agricultural Assistant	Mr. A. A. Ahad, B.Sc. (Agri.)	——
145.	Agricultural Assistant	Bh. Sucha Singh, B.Sc. (Agri.)	——
146.	Agricultural Assistant	Bh. Mukhtar Singh, B.Sc. (Agri.)	——

(v) Cotton Jassid Investigation Scheme.

147.	Agricultural Assistant	Mr. Piare Mohan Verma, M.Sc. (Hons.), Punjab	Research Student, Indian Central Cotton Committee.

HYDERABAD RESEARCH SCHEMES.

(i) Botanical Scheme.

148.	Cotton Research Botanist	Rai Sahib Kalidas Sawhney, M.Sc. (Punjab) ..	Late Cotton Breeder in the Department of Agriculture, Iraq, Baghdad.
149.	Assistant Cotton Research Botanist ..	Mr. D. V. Narayanayya, Dip. Agri. (Poona) ..	On deputation from Bombay Department of Agriculture.
150.	Assistant Cotton Research Botanist ..	Mr. V. K. Bederker, B.A. (Madras), B.Ag. (Bombay).	On deputation from H. E. H. the Nizam's Department of Agriculture.
151.	Inspector, Variety Testing Stations ..	Mr. A. R. Betigeri, B.Ag. (Bombay)	——

(ii) Hyderabad (Pink and Spotted Boll-worm) Scheme.

152.	Cotton Entomologist	Mr. H. D. Nangpal, M.Sc. (Hons.) (Punjab) ..	Research Student, Indian Central Cotton Committee and Assistant Entomologist, United Provinces Pink Bollworm Scheme.

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1938—*contd.*

HYDERABAD RESEARCH SCHEMES—*contd.*

(*ii*) *Hyderabad (Pink and Spotted Boll-worm) Scheme*—contd.

153.	Senior Research Assistant	Mr. N. T. Nadkarny, B.Ag. (Bombay), Post-Graduate Course in Entomology at Poona Agricultural College.		——
154.	Junior Research Assistant	Mr. T. E. Krishnaswamy, B.Sc. (Agri.) (Coimbatore).		——
155.	Junior Research Assistant	Mr. Mohd. Ahsan, B.Sc. Osmania University ..		——
156.	Junior Research Assistant	Mr. V. K. Dabholkar, B.Sc. (Agri.)		——

(*iii*) *Kumpta Cotton Improvement Scheme.*

157.	Senior Research Assistant	Mr. N. R. Yardi, B.Ag. (Bombay)		——

HYDERABAD SEED DISTRIBUTION SCHEME.

158.	Inspector	Mr. M. V. Chitnis		——

BARODA RESEARCH SCHEMES.

(*i*) *Root Rot Scheme.*

159.	Breeding Assistant	Mr. A. A. Mehta, B.Ag. (Bombay)	On deputation from the Baroda Agricultural Department.	
160.	Mycological Assistant	Mr. G. H. Desai, B.Ag. (Bombay)		——

(*ii*) *Plant Puller Propaganda Scheme.*

161.	Plant Puller Officer, Baroda District ..	Mr. D. G. Patel, B.Ag.		——
162.	Non-graduate Assistant, Navsari	Mr. R. S. Patel		——

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1938—*concld.*

		BARODA RESEARCH SCHEMES—*contd.*		
		(iii) Dholleras Cotton Improvement Scheme.		
163.	Cotton Breeder	Mr. A. F. Patel, B.Ag. (Bombay)		—
164.	Assistant Cotton Breeder	Mr. R. M. Patel, B.Ag. (Bombay)		—
		BIKANER BENGALS COTTON IMPROVEMENT SCHEME.		
165.	Cotton Assistant	Mr. Arjan Singh, B.Sc.		—
		BENGAL COMILLA COTTON SCHEME.		
166.	Cotton Research Officer	Mr. Maya Prakash Singh, M.Sc. (Lucknow) ..		—
		MYSORE (DODDAHATHI) SCHEME.		
167.	In charge Breeding work and Laboratory Investigation.	Mr. G. Srinivasa Iyengar, M.Sc.		—
168.	Field and Breeding Assistant	Mr. S. G. Narasimhacher, M.Sc...		—
		TECHNOLOGICAL ASSISTANTS PAID BY INDIAN CENTRAL COTTON COMMITTEE.		
169.	Under Cotton Specialist, Coimbatore ..	Mr. R. L. N. Iyengar, M.Sc.	Research Student, Indian Central Cotton Committee.	
170.	Under Deputy Director of Agriculture, S.D., Dharwar.	Mr. H. R. Nayak, Inter Science (Madras) ..	Formerly Junior Tester at Technological Laboratory, Bombay.	
171.	Under Deputy Director of Agriculture, Gujerat, Surat.	Mr. Srinagabhushana, B.Sc. (Mysore)	Research Student, Indian Central Cotton Committee.	
172.	Under Cotton Research Botanist, Lyallpur.	Mr. S. Raja Raman, B.A. (Madras), M.Sc. (Benares), A. Inst. P. (London)		—
173.	Under Botanist, Agricultural Research Station, Sakrand.	Mr. K. S. Marar, B.A. (Madras), LL.B. (Bom.)	Formerly Junior Tester at Technological Laboratory, Bombay.	
174.	Under Cotton Research Botanist, Hyderabad—Deccan.	Mr. K. G. Deo, Inter Arts	Do. do.	

APPENDIX XVIII.

LIST OF RESEARCH STUDENTS.

Year of appointment.	Name.	Where posted on appointment.	Branch of Cotton Research in which scholarship granted.	How now employed.	Remarks.
1923	Sohan Singh Bindra, M.Sc., Honours School (Punjab).	Lyallpur	Cotton Entomology.	....	Late Assistant Entomologist, Pink Bollworm Research Scheme, Punjab. Recently in Agricultural Department, Kenya.
,,	Mohammad Afzal, B.Sc. (Punjab).	Do.	Cotton Botany (Plant Breeding).	Punjab Agricultural Department, Cotton Research Botanist, Punjab Botanical Research Scheme.	Indian Central Cotton Committee.
,,	Sheo Shankar Pande, M.Sc. (Punjab).	Nagpur	Do. ..	Assistant to Economic Botanist for Cotton, Central Provinces Botanical Research Scheme.	Do.
,,	Jiwan Singh, M.Sc. (Punjab).	Do.	Cotton Mycology ..	Reader in Botany, Khalsa College, Amritsar.	Late Senior Mycological Assistant, Central Provinces Wilt Investigation Scheme.
,,	Ilabanto Banerji, M.Sc., (Calcutta).	Coimbatore ..	Cotton Botany ..	University Lecturer in Botany, Calcutta University, from 31st January 1929.	Held a Senior Research Studentship under Dr. M. A. Sampath-Kumaran, M.A., Ph.D., Central College, Bangalore, and at the Institute of Plant Industry, Indore, from April 1926 to March 1928.

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LIST OF RESEARCH STUDENTS—*contd.*

Year of appointment.	Name.	Where posted on appointment.	Branch of Cotton Research in which scholarship granted.	How now employed.	Remarks.
1923	B. B. Desai, B.Ag. (Bombay).	Dharwar	Cotton Botany ..	Sind Agricultural Department, Cotton Breeder, Sind, Mirpurkhas.	Held a Senior Research Studentship at the Institute of Plant Industry, Indore, from July 1926 to June 1927.
1924	Atul Chandra Dutta, M.Sc. (Calcutta).	Coimbatore	Do. ..	Lecturer in Botany, Cotton College, Gauhati, Assam.	....
,,	N. Hari Rao, M.Sc. (Calcutta).	Technological Research Laboratory, Matunga, Bombay.	Textile Physics ..	Senior Research Assistant (Physicist), Technological Research Laboratory, Matunga, Bombay.	Indian Central Cotton Committee.
,,	H. D. Nangapal, M.Sc., Honours School (Punjab).	Cawnpore	Cotton Entomology.	Entomologist, Hyderabad Pink and Spotted Bollworm Scheme, Parbhani.	Late Special Research Assistant, Pink Bollworm Investigation, United Provinces.
,,	Sant Bahadur Singh, M.Sc. (Benares Hindu University).	Surat	Cotton Physiology.	....	Resigned in August 1924 to go to Cambridge for further study. Obtained Ph.D.
1925	Vishwa Ram Singh, L.Ag. (Agricultural College, Cawnpore).	Cawnpore	Cotton Entomology.	United Provinces Subordinate Agricultural Service.	Late Research Assistant under the Entomologist to Government, United Provinces—Pink Boll-worm Investigation Scheme.
,,	Akbar Ali, B.Sc. (Punjab) ..	Lyallpur	Cotton Botany (Plant Breeding.)	Punjab Agricultural Department, Agricultural Assistant, Punjab Botanical Research Scheme.	Indian Central Cotton Committee.

LIST OF RESEARCH STUDENTS—*contd.*

Year of appointment.	Name.	Where posted on appointment.	Branch of Cotton Research in which scholarship granted.	How now employed.	Remarks.
1925	Kidar Nath Trehan, M.Sc. (Punjab).	Lyallpur	Cotton Entomology	Punjab Agricultural Department, Assistant Cotton Entomologist, White Fly Investigation Scheme, Punjab.	Held Senior Research Studentship for study of "White Fly" problem at Khanewal. Indian Central Cotton Committee.
8 ,,	S. E. Kumana, B.A., M.Sc. (Bombay).	Technological Research Laboratory, Matunga, Bombay.	Cotton Technology.	....	Technological Assistant, Dharwar, up to 31st July 1929. Went abroad for further study.
,,	J. D. Ranadive, B.Ag. (Bombay).	Dharwar	Cotton Mycology ..	Pathological Assistant, Cotton Breeding Scheme, Jalgaon, Khandesh.	Indian Central Cotton Committee.
,,	P. K. Roy, M.Sc. (Dacca) ..	Technological Research Laboratory, Matunga, Bombay.	Textile Physics ..	....	Resigned in July 1925.
,,	K. R. Sen, M.Sc. (Dacca) ..	Do.	Do. ..	Technological Assistant, Lyallpur.	Indian Central Cotton Committee. Obtained a Doctorate (D.Sc.) in 1934.
,,	L. N. Rao, M.Sc. (Calcutta).	Do. ..	Cotton Microscopy.	Lecturer in Botany, Central College, Bangalore.	Resigned in August 1926.
1926	D. F. Kapadia, B.A. (Bombay), M.Sc. (Tech.), (Manchester).	Do. ..	Cotton Technology.	Head of the Textile Manufactures Department, Victoria Jubilee Technical Institute, Bombay.	Late Senior Research Assistant, Assistant Technologist, Technological Research Laboratory, Matunga, Bombay.

LIST OF RESEARCH STUDENTS—*contd.*

Year of appointment.	Name.	Where posted on appointment.	Branch of Cotton Research in which scholarship granted.	How now employed.	Remarks.
1926	Ram Saran Koshal, M.Sc. (Punjab).	Technological Research Laboratory, Matunga, Bombay.	Textile Physics ..	Senior Research Assistant (Physicist), Technological Research Laboratory, Matunga, Bombay.	Indian Central Cotton Committee.
,,	M. A. Shama Iyengar, B.Ag. (Bombay).	Surat	Cotton Physiology .	Sind Agricultural Department, Senior Assistant to Agricultural Chemist and Soil Physicist, Sakrand.	Awarded a Training Grant for foreign study in 1933.
,,	Karam Singh Lamba, B.Sc. Honours School (Punjab).	Lyallpur	Cotton Entomology.	....	Resigned in July 1927.
,,	Y. D. Wad, M.A., M. Sc. (Bombay), A.I.I.Sc.	Coimbatore.. ..	Cotton Bio-chemistry.	Chemist and Agronomist, Institute of Plant Industry, Indore.	Indian Central Cotton Committee.
,,	H. A. Idnani, B.Ag. (Bombay).	Institute of Plant Industry, Indore.	Cotton Botany ..	Sind Agricultural Department, Cotton Supervisor, Indus Right Bank, Sind Seed Distribution Scheme, Dadu.	Do.
,,	S. C. Talesara, B.Ag. (Bombay).	Do. ..	Do. ..	Assistant Farm Superintendent, Institute of Plant Industry, Indore.	Do.
1927	R. Lakshminarasimha Iyengar, M.Sc.	Technological Research Laboratory, Matunga, Bombay.	Cotton Technology.	Technological Assistant, Coimbatore.	Do.
,,	Anant Krishna Thakur, M.Sc. (Bombay).	Institute of Plant Industry, Indore.	Cotton Bio-chemistry.	Assistant Chemist, Indian Lac Research Association.	....
,,	Dev Raj Mehta, B.Sc., Honours School (Punjab).	Lyallpur	Cotton Entomology.	....	Secured Government Scholarship for study abroad and obtained Ph. D. (Cantab).

Year of appointment.	Name.	Where posted on appointment.	Branch of Cotton Research in which scholarship granted.	How now employed.	Remarks.
1927	Uma Shankar, M.Sc. (Allahabad).	Cawnpore	Cotton Entomology	Assistant Professor of Zoology and Entomology, Agricultural College, Cawnpore.	Obtained Doctorate at Edinburgh.
9 ,,	Shripad Shamrao Rane, M.Sc. (Benares Hindu University).	Institute of Plant Industry, Indore.	Cotton Physiology.	Unemployed	....
,,	Sant Singh Verma, M.Sc. (Benares Hindu University).	Dharwar	Cotton Physiology in connection with Cotton Wilt Investigation.	....	Awarded a Foreign Scholarship by the Indian Central Cotton Committee. Obtained Ph.D. (Lond.)
,,	Lakshmi Narayan Mathur, M.Sc. (Punjab).	Institute of Plant Industry, Indore.	Cotton Breeding ..	Crop Botanist, Ujjain, Gwalior Department of Agriculture.	....
,,	Kadaba Rangaswamy, M.Sc. (Calcutta).	Coimbatore.. ..	Do. ..	Unemployed	....
,,	S. Shamser Singh, M.Sc. (Punjab).	Institute of Plan Industry, Indore.	Cotton Agronomy..	Agricultural Officer, Bikaner State.	....
1928	K. Dharmarajulu, M.Sc. (Bombay).	Dharwar	Cotton Mycology ..	Assistant Botanist, Madras Pempheres and Physiological Scheme.	Indian Central Cotton Committee.
,,	Piare Mohan, B.Sc., Honours School (Punjab), M.Sc.	Cawnpore	Cotton Entomology	Agr. Assistant, Cotton Jassid Investigation Scheme, Punjab.	Do.
5 ,,	R. N. Gidwani, B.Ag. (Bombay).	Surat	Cotton Agronomy.	Sind Agricultural Department, Inspector of Agriculture, Eastern Nara Circle, Mirpurkhas.	....
,,	M. Kanti Raj, M.A., B.Sc. (Agri.) (University of Edin.)	Institute of Plant Industry, Indore.	Do. ..	Madras Agricultural Service.	....
,,	C. Nanjundayya, M.Sc. (Calcutta).	Technological Research Laboratory, Matunga, Bombay.	Cotton Technology.	Junior Research Assistant, Technological Research Laboratory, Matunga, Bombay.	Indian Central Cotton Committee.

LIST OF RESEARCH STUDENTS—*contd.*

Year of appointment.	Name.	Where posted on appointment.	Branch of Cotton Research in which scholarship granted.	How now employed.	Remarks.
1929	Sringabhushana, B.Sc. ..	Technological Research Laboratory, Matunga, Bombay.	Cotton Technology.	Technological Assistant, Surat.	Indian Central Cotton Committee.
3 ,,	Bhai Pratap Singh Bhullar, B.Sc. (Agri.) (Punjab).	Lyallpur	Cotton Marketing and Economics.	Punjab Agricultural Department.	....
,,	Bhai Ajaib Singh Gulzar, B.Sc. (Agri.) (Punjab).	Do.	Do. ..	Do. ..	....
1930	Madan Lal Bhatia, M.Sc. (Punjab).	Do.	Entomology ..	Abroad for further study .	....
,,	Bhola Nath, M.Sc. (Punjab).	Institute of Plant Industry, Indore.	Cytology and Plant Breeding.	Genetical Assistant, Institute of Plant Industry. Indore.	Indian Central Cotton Committee.
4 ,,	Pran Nath Mehra, M.Sc. (Punjab).	Sakrand	Do. ..	....	Resigned.
,,	Brajendra Nath Bhargava, M.A. (Lucknow).	Lucknow	Cotton Marketing and Economics.	....	....
1931	B. S. Sheshgiri, B.Ag. (Bombay).	Surat, Gujerat ..	Do. ..	....	Resigned.
,,	K. R. Dube, B.Ag. (Nagpur).	Nagpur	Do. ..	District Supervisor, Enquiry into the cost of production of Cotton and Sugarcane crops, Central Provinces.	....
4 ,,	Santokh Singh Jaggi, B.Sc. (Agri.) (Punjab).	Lyallpur	Do. ..	Agricultural Assistant, Punjab Botanical Research Scheme.	Indian Central Cotton Committee.
,,	Doraiswami Ayyar, B.A. B.Sc. (Agri.) (Madras).	Madras	Do.	Madras Agricultural Service.	....
1 1935	Krishna Behari Lal, M.Sc. (Cal.), Ph.D. (Edinburgh).	Lyallpur	Cotton Entomology.	Second Assistant Entomologist at the Imperial Agricultural Research Institute, New Delhi.	....

LIST OF RESEARCH STUDENTS—*contd.*

Year of appointment.	Name.	Where posted on appointment.	Branch of Cotton Research in which scholarship granted.	How now employed.	Remarks.
2 1936	M. U. Parmar, M.Sc., (Bombay).	Technological Research Laboratory, Matunga, Bombay.	Cotton Technology.	Research Student	Under training.
2 ,,	G. Rama Rau, B.Sc. (Bombay).	Do. ..	Do. ..	....	....
		Foreign Research Studentships.		..	
1 1931	Sant Singh Verma, M.Sc. (Benares Hindu University).	Imperial College of Science and Technology, London.	Plant Physiology ..	Assistant Physiologist Punjab Physological Scheme.	Completed training, July 1935. Obtained Ph.D. of London University.
			Training Grants.		
2 1933	S. N. Venkataramanan, B.A., B.Sc. (Agri.) (Madras).	Calcutta	Cotton Statistics ..	Madras Agricultural Service	....
2 ,,	C. Jagannatha Rao, B.A. (Madras).	....	Cotton Physiology.	Madras Agricultural Sevice	....
1 1936	P. Abraham, B.A. (Madras)	....	Cotton Cytology ..	Research Student	Under training.
		Foreign Training Grants.			
1933	M. Taskhir Ahmad, B.Sc. (Agri.), (Punjab).	Trinity College, Cambridge.	Entomology ..	Assistant Entomologist, Imperial of Agricultural Research Institute, New Delhi.	....
2	G. B. Patel, B.Ag. (Bombay).	University of California, U.S.A.	Cotton Breeding ..	Bombay Agricultural Department.	Completed training, July 1936. Obtained M.Sc. of California University.

Year of appointment.	Name.	Where posted on appointment.	Branch of Cotton Research in which scholarship granted.	How now employed.	Remarks.
2 1934	M. A. Shama Iyengar, B.Ag. (Bombay).	Tour in Hungary, England and Egypt.	Study of Kalar (alkali) lands and cultivation of superior Egyptian cottons with special reference to soil and environmental conditions.	Sind Agricultural Department, Senior Assistant to Agricultural Chemist and Soil Physicist.	....
,,	Nazir Ahmad, M.Sc. (Punjab).	Imperial College of Science and Technology, London.	Entomology ..	....	Obtained Diploma of Imperial College of Science & Technology, London.
1 1936	Kidar Nath Trehan, M.Sc. (Punjab).	Rothamsted Expt. Station.	Applied Entomology	Punjab Agricultural Dept.	Completed training Sept. 1938. Obtained Ph.D. of London University.
1 1938	V. G. Panse, B.Sc.	Rothamsted Expt. Station and London University.	Statistical Methods.	Not yet joined	....

"Indian Central Cotton Committee" in the remarks column indicates a post paid for from one of the Committee's Research Grants.

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ANNUAL REPORT

OF THE

INDIAN CENTRAL COTTON COMMITTEE

FOR THE

YEAR ENDING 31st AUGUST 1939.

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ANNUAL REPORT OF THE INDIAN CENTRAL COTTON COMMITTEE FOR THE YEAR ENDING 31st AUGUST 1939.

CHAPTER I.

1. CONSTITUTION, AIMS AND OBJECTS.

THE Indian Central Cotton Committee was constituted by the Government of India in the Department of Revenue and Agriculture, in their Resolution No. 404-22, dated the 31st March 1921, as a result of the recommendation of the Indian Cotton Committee of 1917-18. Originally, the Committee was purely an advisory body but, with its incorporation under the Indian Cotton Cess Act in 1923, it became an administrative body having at its disposal funds "for the improvement and development of the growing, marketing and manufacture of cotton in India". The funds of the Committee are derived from the cotton cess of two annas per bale (four annas for the first three years) which was imposed in 1923. Having complete control over its funds, the Committee has been able to build up a satisfactory reserve and is at present spending over Rs. 10,00,000 per annum on cotton improvement, mainly on agricultural and technological research and seed distribution schemes.

Including as it does representatives of growers, agricultural officers, traders, spinners and manufacturers, the Committee has been an invaluable forum for the discussion of many problems of general concern. The ever increasing understanding which has arisen from the association of leading commercial representatives with growers and research workers has led to developments which, at one time, seemed impossible, whilst as an authoritative body to advise the Central and Provincial Governments on the important matters of cotton policy, the Committee has attained an outstanding position. Today it may be aptly described as 'Information Bureau' for everything pertaining to Indian cotton.

The activities of the Committee extend to all branches of cotton improvement in India; it provides funds for research into cotton problems of all-India importance and for the development, extension and marketing of improved varieties of cotton. The aim always is to supplement and not supplant the work of the Agricultural Departments in the cotton growing provinces and Indian States. Though, as a matter of convenience, the Committee has laid

down certain lines of demarcation regarding the investigations which it considers appropriate for its grants, the general policy is to give assistance in the directions where it is most needed in the carrying out of a co-ordinated policy of cotton improvement. The Committee has, however, not stopped at the production of better cotton, but from its inception has devoted special attention to better marketing, to the prevention of adulteration and other abuses and to many other problems connected with the cotton trade of the country. The readiness with which trade associations, particularly the East India Cotton Association, have taken action on recommendations designed to benefit the cotton grower has made the task of the Committee much easier. Whilst the Committee's constitution ensures a broad outlook on the many problems affecting the cotton industry, its primary concern is the interest and welfare of the cotton grower.

2. PERSONNEL.

Sir Bryce Burt continued as President of the Committee until the 31st March 1939, when he proceeded on leave preparatory to retirement, and Mr. P. M. Kharegat, C. I. E., I. C. S., who succeeded him as Vice-Chairman of the Imperial Council of Agricultural Research, became *ex-officio* President. At its meeting held on the 31st March 1939, the Committee recorded its appreciation of the services of Sir Bryce Burt in the following resolution :—

> "The Indian Central Cotton Committee wishes to place on record its appreciation of the valuable services rendered by Sir Bryce Burt during the past eighteen years of his association with it, first as Secretary, then as member and finally as its President. It feels that the success of the work of the Committee can in large measure be said to be due to his advice, guidance and close attention to problems connected with cotton development in India.
>
> The Indian Central Cotton Committee tenders its grateful thanks to Sir Bryce Burt for his services and offers him its best wishes for a continuously useful and happy life."

A list of the members constituting the Committee and the various interests they represent as on 31st August 1939 is given in Appendix I. Under the Indian Cotton Cess Rules, members who are not *ex-officio* members hold office for three years and one-third of their number retire each year in rotation. The term of office of additional members appointed by the Governor General in Council under Section 4 (xi) of the Indian Cotton Cess Act is three years or such lesser period as may be specified in the notification of appointment.

3. ADMINISTRATION.

Mr. D. N. Mahta continued as Secretary of the Committee throughout the year. On completion of the probationary period, Mr. Ajodhya Sahai was confirmed in the post of Superintendent in the Secretary's office. Dr. Nazir Ahmad continued as Director of the Committee's Technological Laboratory.

The administration of the Committee is carried on with the help of the Standing Finance Sub-Committee which is the principal executive body of the Committee and exercises its powers under Rule 10(2) of the Indian Cotton Cess Rules. It is a statutory Sub-Committee appointed to hold office for 12 months from 1st April and consists of nine members including the President and the Vice-President who are *ex-officio* members, the Vice-President being the *ex-officio* Chairman. By resolutions of the Committee, one of the members of this Sub-Committee must be a representative of cotton growers and one an agricultural officer. Subject to such restrictions as may be at any time imposed by the Committee, the Finance Sub-Committee exercises all the powers of the Committee in regard to the control and disposal of the funds of the Committee and such other powers as may be delegated to it. The members of this Sub-Committee during the period under review were: Sir Chunilal V. Mehta, (Vice-President), Chairman ; Mr. P. M. Kharegat, (*ex-officio*) ; Sir Purshotamdas Thakurdas ; Mr. S. D. Saklatvala ; Mr. Kasturbhai Lalbhai ; Mr. J. Vonesch; Mr. M. S. Durutti ; Mr. W. J. Jenkins ; and Sardar Rao Bahadur Bhimbhai Ranchodji Naik.

4. SUB-COMMITTEES.

Most of the detailed work of the Committee is carried on through Sub-Committees ; this not only effects a considerable saving of time but also lightens the task of the Committee at its half-yearly meetings.

The functions of the Standing Finance Sub-Committee as well as its personnel have already been stated. The functions of the other Sub-Committees are detailed below and their composition as on the 31st August 1939 is given in Appendix II.

Agricultural Research Sub-Committee.—As its name implies, this Sub-Committee is concerned with matters relating to research and extension schemes financed by the Committee. It reports on the progress made on research and seed distribution schemes, examines proposals for new schemes or for extension of old schemes, and also considers the progress made and the work done by the Committee's research students. This Sub-Committee ordinarily assembles half-yearly a day or two before the meetings of the full Committee. The constitution of this Sub-Committee was laid down at the 10th meeting of the Indian Central Cotton Committee. Since then, additions have been made from time to time. Two meetings of this Sub-Committee were held during the year under review.

Local Sub-Committee.—This Sub-Committee is composed of local members and those residing within easy reach of Bombay, and is concerned with matters of a general nature not involving finance which cannot be postponed for consideration to the usual half-yearly meetings of the full Committee. No number is prescribed. Six meetings of this Sub-Committee were held during the past year.

Technological Research Sub-Committee.—This Sub-Committee deals with matters relating to Technological Research. It was originally constituted at

the January 1924 meeting of the Committee with the object of advising the Director of the Technological Laboratory on technical matters. It generally meets during the time of the half-yearly meetings of the full Committee. Three meetings of this Sub-Committee were held during the year under review.

Wider Markets Sub-Committee.—This Sub-Committee was constituted by the Committee at its meeting held in August 1933, for investigating the question of finding wider markets for Indian cotton. One meeting of this Sub-Committee was held during the past year.

Standards Sub-Committee.—This Sub-Committee was constituted in April 1933 and is concerned with the preparation for use in India of Universal standards of certain growths of cotton dealt with in common both by the East India Cotton Association and the Karachi Cotton Association and of certain other varieties with which only the former Association is concerned. Seven meetings of this Sub-Committee were held during the year.

Cotton Forecast Improvement Sub-Committee.—This Sub-Committee was constituted by the Committee at its meeting held in February 1933, its principal business being the improvement of the accuracy of cotton forecasts of India. It usually meets half-yearly, a day or two before the meetings of the full Committee. Two meetings of this Sub-Committee were held during the past year.

Research Students Selection Sub-Committee.—This Sub-Committee is concerned with the selection of students for scholarships or training grants for research in the several sciences relating to cotton. No meeting of this Sub-Committee was held during the past year.

Cotton Ginning and Pressing Factories Sub-Committee.—This Sub-Committee is appointed by statute to attend to matters arising out of the Cotton Ginning and Pressing Factories Act, 1925. Members of this Sub-Committee hold office for twelve months from 1st April. No meeting of this Sub-Committee was held during the year under review.

In addition to the above, Special Sub-Committees are appointed from time to time to deal with specific matters which do not directly fall within the purview of any of the other Sub-Committees. Three such Sub-Committees, (1) Special Sub-Committee to examine and report on the Present Position of Indian Cotton, (2) Special Sub-Committee to report on 'Hedging Facilities' and (3) Special Sub-Committee to report on present position of Root Rot investigations, were appointed during the year.

During the period under review the following members represented the Committee on the Board of Governors of the Institute of Plant Industry, Indore :—

The President,
Sir Chunilal V. Mehta (*Vice-President*),
Sir Purshotamdas Thakurdas,
Mr. S. D. Sakalatvala,

Mr. J. Vonesoh,
Mr. Kasturbhai Lalbhai,
Mr. M. S. Durutti,
Mr. W. J. Jenkins,
Sardar Rao Bahadur Bhimbhai R. Naik,
Mr. Chandulal P. Parikh, and
The Secretary.

Rao Bahadur Sir Madhaorao Deshpande continued to represent the Committee on the Imperial Council of Agricultural Research. Under Article 51, as amended, of the Articles of Association of the East India Cotton Association, the Committee is entitled to nominate from amongst the growers' representatives three persons, whether members of the Association or not, not having dealings in forward contracts, as Directors of the Association. Sardar Rao Bahadur Bhimbhai R. Naik, Sardar Bahadur Gurbachan Singh and Mr. M. P. Kolhe were appointed by the Committee for the cotton year 1938-39. Mr. M. P. Kolhe, whose term of office as member of the Committee expired on 31st March 1939, ceased to be a member of the Board of Directors of the Association from that date, and the vacancy was filled by Mr. H. Sitarama Reddy.

The Committee is an Associate Member of the International Federation of Master Cotton Spinners' and Manufacturers' Associations.

5. PROVINCIAL COTTON COMMITTEES.

The value of Provincial Cotton Committees in dealing with problems of provincial importance has been stressed in previous reports; local problems can be visualised best by those on the spot, and from this point of view the discussions of Provincial Cotton Committees are of considerable assistance to the Indian Central Cotton Committee, particularly in arriving at decisions on matters of a provincial character. Where such Committees had been actively functioning, the work done by them has been of material benefit not only to the Provincial Departments of Agriculture but also to the Committee. It is to be hoped that steps would be taken for the constitution of such Cotton Committees in all the major cotton growing provinces and that, where they already exist, they will funotion regularly.

6. MEETINGS.

Three meetings of the Indian Central Cotton Committee were held during the year under review.

The first meeting was held at Lyallpur in the Punjab on the 17th, 18th and 19th November 1938. This was the third meeting of the Committee to be held outside Bombay, and as the previous two were held at Indore and Karachi respectively, it was the first to be held at a provincial centre of agricultural research. The object of holding this meeting away from the headquarters of the Committee at Bombay was to give members an opportunity of seeing for themselves the work in progress and some of the results achieved from the research

schemes financed by the Committee in the Punjab. The meeting was attended by the Hon'ble Sir Chhotu Ram, Minister for Development, Punjab Government, and Mr. Darling, Financial Commissioner, Development, Punjab, and important matters of cotton policy concerning the Punjab such as ' licensing of ginning and pressing factories in the Punjab ', ' application of Cotton Transport Act to the Punjab ' and the ' Punjab Agricultural Produce Markets Bill ' were discussed in the presence of the Hon'ble Minister for Development. An important subject considered at this meeting was that relating to the present position of Indian cotton, to which a good deal of attention had been devoted by the Local Sub-Committee, and on which a comprehensive note setting out the position had been prepared for the consideration of the Committee. The main conclusions of the discussion were :—

(1) That in no important cotton tract should any cotton be encouraged which is inferior in spinning capacity to the existing cotton of the tract.

(2) That efforts to produce in each tract the best staple for which the tract is suitable should be intensified.

(3) That there should be no relaxation of efforts to reduce mixing and other malpractices which prevent certain cottons from being used to the best advantage.

In view of the scope and complexity of the subject, however, it was decided that a Special Sub-Committee should go into the whole question and that an extra meeting of the committee should be held in March 1939 to consider the report and recommendations of this Special Sub-Committee.

The more important resolutions passed at the Lyallpur meeting are given below :—

(*i*) " That the Indian Central Cotton Committee desires to draw the attention of the Government of India to the serious menace which the import of rayon yarn constitutes to the consumption of Indian cotton, and requests that Government should urgently examine the question of increasing the import duty on rayon."
(*Licensing of ginning and pressing factories in the Punjab.*)

(*ii*) " The Indian Central Cotton Committee welcomes the assurance given by the Hon'ble Minister for Development that he is personally satisfied that it is desirable to prevent the mixing of short staple with long staple cotton and that though he cannot commit himself he will invite the Punjab Government to give early consideration to the introduction of the licensing of gins and presses in order to stop the mixing of Punjab American cotton as the Committee is convinced that this step is in the best interests of cotton production in the Punjab and India as a whole."
(*Application of the Cotton Transport Act to the Punjab.*)

(*iii*) " The Indian Central Cotton Committee notes the difficulties of the Punjab Government in applying the Cotton Transport Act to the Punjab under the existing conditions. The Committee, however, requests the Punjab Government to examine the imports of short staple *kapas* by rail into areas growing long stapled cotton with a view to persuade the North-Western Railway not to give wagons for carriage of *kapas* without a license being procured by importers of such cottons from the Agricultural Department of the Punjab Government."

In accordance with the decision of the Committee at its meeting held at Lyallpur, an extra meeting of the Committee was held on the 31st March 1939, with the main object of considering the report of the Special Sub-Committee on the Present Position of Indian Cotton, which had met on the two previous days. The report of the Special Sub-Committee which with a few minor amendments was adopted by the full Committees is contained in Appendix III. The resolutions passed by the Committee at this meeting are given below :—

Better balancing of short and long staple cottons in India.

(*i*) "The Committee is of the opinion that while satisfactory progress in the matter of replacement of short staple cotton by long and medium staple cotton has been made during the past few years, further investigations in this connection appear necessary and the process of better balancing of short and long staple cottons in India should continue. With this object, efforts should be made to obtain fresh breeding material from all possible sources. The Committee feels, however, that the advantages of the change to the cultivator should, at no stage, be overlooked and due consideration should continually be given as to what would be the most paying type of cotton for him to grow in the long run."

Raising the efficiency of cotton cultivation.

(*ii*) " The Committee notes that, while as a result of the joint efforts of the Indian Central Cotton Committee and the Provincial Departments of Agriculture, some improvement in the outturn of cotton per acre in India has taken place, the yield still compares very unfavourably with other countries and in many areas is extremely low. It, therefore, recommends :—

(*a*) the starting in major cotton growing tracts of cotton cultivation projects which would be complete holdings or preferably villages managed and cultivated by the cultivators themselves according to the best system advised by the local Agricultural Department and where the results of research work could be concentrated in practice and demonstrated to growers under cultivators' conditions with the improved type or types of cotton best suited to each tract,

(*b*) the keeping of accounts giving information as to the expenditure and income of the projects referred to above.

The Committee further recommends that such work should be carried out by the Provincial Departments of Agriculture in collaboration with the Indian Central Cotton Committee in selected holdings or villages."

Collection of fresh breeding material.

(*iii*) "The Committee recommends that the President of the Indian Central Cotton Committee should get into touch with the Russian Institute of Plant Breeding, Tashkent, and see what can be done in the way of getting seeds of cotton varieties collected in their present expedition. It is also suggested that the Imperial Bureau of Plant Genetics (Cambridge) be asked to give all possible information and help.

Thereafter the question of a special expedition should be reconsidered, if necessary."

Intensification of efforts to check malpractices and improvement of marketing to ensure that cottons reach spinners in pure condition to enable their being put to optimum use.

(*iv*) "The Committee reiterates the view it has expressed on several occasions that there should be no relaxation of efforts to reduce mixing and other malpractices which prevent certain Indian cottons from being used to the best advantage and which adversely affect the cultivator. It, therefore, recommends that wherever possible the Cotton Transport Act as well as the Cotton Control Act and the Cotton Ginning and Pressing Factories Act should be applied."

Increase in import duty on foreign cotton.

(*v*) "The Indian Central Cotton Committee desires to place it on record that it has not recommended an increase in the duty on all foreign cotton. It reiterates the view expressed in 1937 and 1938 that should the parity of Indian and imported cotton move to a point justifying such action the import duty should be increased on all cottons which compete with Indian cotton, *i.e.*, cottons below 1" staple at present."

(*vi*) "The Committee is of the opinion that the recent increase in import duty on foreign cotton to be effective in helping the production of long staple cotton in India should have been accompanied by restriction on the import of foreign yarn and cloth or a corresponding increase in duty on such imports."

Export subsidy for American cotton.

(*vii*) "In view of the news received recently to the effect that U.S.A. intend granting an export subsidy for American cotton to the extent of 1.25 to 2 cents per lb. of cotton exported from the U.S.A., this Committee recommends that Government of India should consider without delay the necessity of the indigenous cotton market being preserved for Indian cotton and urges them to adequately raise import duties on subsidised cotton, cotton cloth and yarn in such effective manner as will prevent cloth and yarn made out of bounty-fed American cotton from replacing manufactures of Indian cotton and to take such other effective steps in consultation with the Indian Central Cotton Committee as may appear feasible."

The third meeting of the year was held at Bombay on the 3rd and 4th August 1939. This was the usual monsoon meeting at which progress reports on the various schemes financed by the Committee are examined. Considerable attention was devoted at this meeting to the question of the measures that should be taken to deal with the situation arising from the grant by the U.S.A. of a subsidy of 1.5 cents per lb. on exports of American cotton to protect the interests of the Indian cotton grower. The matter was first examined in detail by a Special Sub-Committee, and the suggestions made by it were considered by the full Committee, a lengthy discussion ensued and finally the following resolution was passed by a majority :—

"In the opinion of the Indian Central Cotton Committee a very grave situation has arisen as a result of the grant by the U.S.A. of a subsidy on exports of American cotton. The Committee accordingly recommends to the Government of India, in the interests of the cotton grower, to take immediate steps to give effect to the following measures :—

(1) The grant of subsidy by America has so changed the situation and the conditions now facing the Indian cotton grower are so serious as to make it necessary for the Government of India to bring into operation Article 4 of the Indo-Japanese Trade Pact and Article 15 of the Indo-British Trade Agreement with a view to adequately increasing the import duties on cotton cloth from Japan and the United Kingdom or restricting the quantity of cloth imported from these two countries.

(2) Heavy import duty should be immediately imposed on all yarn imported into India.

(3) Adequate import duty should be imposed on all artificial silk cloth and yarn so as to effectively restrict their importation into India.

(4) A Barter agreement should be arranged with the United Kingdom to take off the Indian market a definite quantity of Indian cotton for war reserve purposes.

(5) This Committee is further of the opinion that Japan should undertake to regulate its offtake of Indian cotton so that its shipments may be fairly evenly distributed over the year and not left to the tail end of the crop movement before making its purchases.

If the above recommendations are accepted by Government and it is considered desirable to enhance duties on imported cotton which competes or is capable of competing with Indian cotton with a view to increasing the use of Indian cotton in mills in India, the Indian Central Cotton Committee will be prepared to depute a Committee of its members to discuss the question."

The Committee at the same meeting also considered the report of a Special Sub-Committee appointed to examine and report on the subject of providing better hedging facilities for Indian cotton. Briefly the recommendations of the Special Sub-Committee were :—

(*a*) that the East India Cotton Association should be requested to permit futures trading in the Broach Futures Contract in March and 14 months ahead of the April-May delivery period with immediate effect and without waiting until the question of unitary control was finally settled ;

(*b*) that the East India Cotton Association should be addressed to take early steps to revise the hedge contracts so as to secure better hedging facilities for staple cottons, and

(*c*) that the question of widening the *Oomra* Contract so as to include the whole of the *Oomra* crop should be taken up when normal conditions in the cotton trade are restored.

The above recommendations were accepted by the Committee. The following were the other more important resolutions passed by the Committee at this meeting :—

Application of the Cotton Ginning and Pressing Factories (Bombay Amendment) Act, 1936, to Sind.

(*i*) "The Indian Central Cotton Committee expresses its disappointment at the decision of the Sind Government to postpone the application of the Cotton Ginning and Pressing Factories (Bombay Amendment) Act and the Rules to the next year and desires to reiterate its oft-expressed view that in the interests of the reputation of Sind cotton in the Indian market and in the markets abroad, and in order that the malpractices of mixing and adulteration may be stopped in the newly developed cotton areas in Sind, the Act and the Rules framed thereunder should be brought into force without further loss of time.

The Committee is further of the opinion that the Sind Government should be intimated that the contribution of the Central Cotton

Committee towards Sind Seed Distribution and Extension Scheme would be considered in the light of the action taken by the Sind Government on this resolution."

Control of importation of Artificial Silk Yarn.

(*ii*) "This Committee is of the opinion that early steps should be taken to control the importation of artificial silk yarns by raising the tariff or by including them under the quota. With regard to cotton yarn, similar action should be taken with due regard to the interests of the handloom weaver."

CHAPTER II.

RESEARCH.

THE research policy of the Committee is carried out by the grant of subsidies to Departments of Agriculture in the various cotton growing provinces and Indian States for specific investigations on cotton. The research schemes include botanical for breeding high yielding superior types of cotton, entomological for the study of the life history of certain cotton pests and measures to combat them, mycological for ascertaining ways and means to prevent loss due to fungoid diseases and physiological for the investigation of crop growth and causes of bud and boll shedding. In addition, fundamental research on cotton genetics, physiology and agronomy is carried out at the Institute of Plant Industry, Indore, with the aid of funds provided by the Committee. The Committee also maintains a well-equipped Technological Laboratory for research on cotton technology. A close touch is maintained with the work being done under the various schemes and at the Technological Laboratory, by means of progress reports and programmes of work which are critically examined by Special Sub-Committees. The procedure adopted is that all schemes, before being approved, are thoroughly examined, first in the Secretary's office, then by Special Sub-Committees of the Agricultural Research Sub-Committee, then by the full Agricultural Research Sub-Committee and finally by the Indian Central Cotton Committee. The Committee also gives grants to Agricultural Departments and Co-operative Sale Societies (through Agricultural Departments) for the extension and marketing of improved varieties of cotton and the maintenance of nuclei of pure seed of approved strains of cotton. Scholarships and training grants for post-graduate training in subjects pertaining to various aspects of cotton are also sanctioned whenever necessary, the selected candidate being sent abroad for the requisite training, if adequate facilities are not available in India.

During the year under report, 37 research schemes, 15 seed extension and marketing schemes and 4 nuclei schemes were sanctioned at a total estimated cost of Rs. 5,56,761. In addition, Rs. 1,89,123 and Rs. 1,11,000 were sanctioned for the Technological Laboratory, Matunga, and the Institute of Plant Industry, Indore, respectively.

1. FUNDAMENTAL RESEARCH.

Fundamental research on cotton genetics, physiology and agronomy is conducted at the Institute of Plant Industry, Indore. The primary object of the Committee in financing this Institute which was established in 1924 was to provide a central research station for cotton in the black soil area of the Malwa Plateau. The Institute is maintained by annual contribution from the Committee on the one hand and the Member States in Central India and Rajputana on the other; representation on the Governing Body of

the Institute in any financial year is proportionate to the grants made by the Committee and the Member States during the previous financial year. During the year ending 31st March 1939, the Committee contributed Rs. 1,00,000 and the Member States in Central India and Rajputana Rs. 44,540. The future organisation of the Institute is at present under the consideration of the Committee.

Mr. T. R. Low, the Director of the Institute, was on leave until October 1938; Mr. K. Ramiah, the Geneticist and Botanist officiated as Director during his absence. Mr. V. G. Panse, the Statistician, was deputed by the Committee in September 1938 for a course of study in Europe under Prof. Fisher for a period of two years. Two research students were selected during the year and posted for training in the Genetics and Botany Section of the Institute. Mr. K. Ramiah, the Geneticist and Botanist, was deputed by the Committee to attend the International Congress of Genetics at Edinburgh in August 1939.

A brief review of the work done at the Institute during the year is given below:—

Cotton Genetics.—A new member of the anthocyanin allelomorphic series has been identified in one of the Madras types, *tellapatty*, which has no pigment in the plant body but only a petal spot. This was crossed with three pigmented types and with one having a ghost spot. There was a simple monohybrid segregation in every case, the F_1 being distinguishable, with lighter pigment at the petiole insertion point with the lamina. The independence of the sterility gene in the Million Dollar mutation to the anthocyanin and petal colour genes has been confirmed. It would appear that it is independent of the leaf shape gene also. Preliminary cytological observations on the mutant would appear to show that sterility is due to partial asynapsis. While further studies regarding the interrelationship and linkage values of the several lintless genes in Asiatic cottons are in progress, they have brought out the rather complicated nature of the genetics of 1027 lintless gene.

In accordance with the decision of the Committee, grafts of 23 interspecies hybrids were obtained from Surat for cytogenetical studies; two of them died without producing any flowers and the other 21 were examined for their chromosome numbers by a special smear technique. There were four sets of crosses among the 21, *hirsutum* × *herbaceum*, *hirsutum* × *arboreum*, *herbaceum* × *barbadense*, and *herbaceum* × *religiosum*. The meiotic chromosome number was found to be 39 in all except two crosses of *hirsutum* × *herbaceum* in which the numbers were 52 and 65. While the 39 chromosome types show 13 univalents, 9 vivalents and 2 rings of 4 each, the 52 and 65 chromosome types show a fair amount of multiple associations. The nature of associations in these would appear to indicate the presence of two and three sets of Asiatic chromosomes respectively in the 52 and 65 number types. Further studies are in progress. The material available at Surat is of great value for fundamental studies on cotton genetics and cytology.

Genetic Variability.—Only one year's results have so far been published on the genetic variability in intra-species crosses, with regard to agricultural characters, such as germination, node number, yield, staple length and ginning percentage. The data collected during the last two seasons are being analysed by the Institute's Statistician under the guidance of Prof. R. A. Fisher. The results when published should prove to be of considerable value to plant breeders in the study of quantitative characters.

To test the assumption that the value of an F_2 for selection in plant breeding work is proportional to its mean and genetic variance, the Bengals hybrids whose F_{1s} were compared last year, were experimented with during the year. The characters studied were germination and stand, ginning percentage, lint length and yield. Last year's results had shown the outstanding value of Shan material as a parent, more particularly with regard to improving lint length. The F_2 results have confirmed the above findings and shown that out of the four sets of crosses—*Rajputana* × *Mollisoni*, *Rajputana* × *Cwn. 520*, *Shan* × *Mollisoni*, *Shan* × *Cwn. 520*—selection should be confined to the last two. The experiment with the F_{1s} repeated during the year was laid down in a wilt infected field and observations on mortality due to wilt have given additional information in favour of the *Shan* × *Mollisoni* and *Shan* × *Cwn. 520* crosses for obtaining resistant types.

Physiology.—That the quality of fibre and its spinning value is influenced by the type of land on which it is produced has again been confirmed. Two acclimatised Upland (American) types were grown on *adhan* land at Kharua and on *barani* land in Indore. The lint from the former shows an increase in fibre length, a reduction in fibre weight and about 20% improvement in spinning value over the latter. Incidentally, it has been observed that the improvement in the quality of the produce from *adhan* land is associated with a fall in ginning percentage as compared with the produce from the *barani* land. The difference in ginning percentage is evidently brought about by the greater seed weight of the produce from *adhan* land. This association would appear to apply equally to *desi* cottons also. When a number of *Malvi* strains are grown for comparison both in Kharua and in Indore, the produce of the former place always shows a higher seed weight and a lower ginning percentage than the produce from the latter.

The experiments on the competition effects on *desi* and *Upland* cotton when grown in close association were repeated to include local unselected material in addition to selected types. These have given extremely interesting information. The results previously obtained that the *Upland* variety suffers less and less from red leaf and leaf roll with increasing association with *desi* were again brought out. There is also evidence that the *Upland* variety gains in yield at the expense of *desi*, due to competition effect, and that this effect is even more pronounced in the unselected local type and in the trial laid out on poor land. The *desi* type has given the highest yield in the pure plot. Since there was a certain amount of wilt incidence in the fields where the experiments were carried out, periodical mortality

counts in *desi* were recorded. These records once again showed that the association or close proximity to the *Upland* gives the *desi* a measure of protection against wilt, the mortality being least in the plot where *desi* and *Upland* cottons alternated and in the mixture plot.

As a further step in this line of investigation, another experiment, which was begun last year to study the effect of competition in mixtures of different varieties of cotton on their vigour, yield and spinning value, was repeated. The best *desi* strain, *Malvi 9*, was grown mixed with three other types, another *Malvi* strain, *Verum 434*, and an *Upland* strain. Besides the mixture plots, there were also pure plots of all the four strains. The results were somewhat different from those of the last year. While in no case the yield of the mixture was lower than the higher yielding component in the pure plots, the mixture gave a definitely lower yield than the pure plots. The only consistent result was that the mixture of *Malvi 9* and the *Upland* strain gave a significantly higher yield than the pure *Upland* and a significantly lower yield than the pure *Malvi 9*. An explanation of the apparently contradictory results in the two years is probably to be found in the fact that *Malvi 9* was very poor in germination and gave a low yield last year, while its germination and yield were highly satisfactory this year. The results of the spinning tests on the cottons from last year's experiment furnished by the Technological Laboratory are also interesting. For instance, the mixture of *Malvi 9* with *Verum* gave 25 counts, while the figures for pure *Malvi 9* and *Verum* were 19s and 26s respectively; the mixture of *Malvi 9* and the *Upland* strain gave 20½ counts, against 19's for each separately and lastly, the mixture of *Malvi 9* with another *Malvi* strain gave 22 counts, against 20½ of the latter component.

The experiment to find out a physiological explanation for the differential survival values of the four genotypes comprising the *desi* cotton in Malwa and Nimar was continued. While the data have not been completely analysed yet, the dry weight figures of the vegetative and fruiting parts very clearly indicate that *Malvi* is the most efficient type for Malwa and *Malvi* and *roseum* the most efficient types for Nimar, which confirm the results of census studies. The preponderance of the *roseum* type in Nimar is undoubtedly the result of human efforts to introduce this cotton in the tract and is not due to its inherent greater adaptability to the conditions than *Malvi*.

Cotton Agronomy.—From the series of field trials which have been carried out since 1934 some useful results of practical importance on the manuring of cotton have now emerged. On the black cotton soil of Malwa the response to manure has been found greatest on well drained land of high or medium fertility. Any permanent rise of subsoil water into the zone of the feeding roots during the rains inhibits the manurial effect. The most profitable manure appears to be nicifos 22/18. Over a range of trials, with applications varying from 40 to 140 lbs. per acre, yields of *kapas* increased by 30% to 85%. The value of the increased yield over the unmanured control

plots, allowing for the cost of the manure given, ranged from Rs. 5-5-0 to Rs. 16-8-0 per acre.

With ammonium sulphate results were not so satisfactory, increases of Re. 1 to Rs. 8 per acre over no manure being recorded. It was found that fields which lost their tilth quickly during the rains responded best to this manure when applied mixed with compost in the proportions of 1 : 20 up to 60 lbs. of ammonium sulphate per acre. Higher doses failed to increase yields. This combination was also not effective on good fields, so the response was possibly due more to tilth improvement than to the addition of plant food.

The following oil cakes have also been tried, safflower, groundnut, *tilli*, linseed and *karanj*. Yields increased with groundnut and linseed but were not profitable from the economic point of view. With safflower the profit due to the use of the cake varied from Rs. 4 to Rs. 8-8-0 per acre.

In Rajputana, on the Bikaner Gang Canal, for the May sown cotton crop, compost has been found very effective. A dressing of 200 maunds per acre gave increases in outturn of 20-30%, with an increase in value over unmanured control plots ranging between Rs. 7 and Rs. 9 per acre, both with *desi* and American cottons. This manure has also proved effective when used for cotton under unirrigated conditions in Rajputana.

Breeding and Selection.—Cotton is the chief money crop of Central India. The bulk of the produce, which is known by the trade name of *Oomras*, is grown under *barani* conditions and is a mixture of two distinct species, the *desi* and American. The proportion of these two species varies from 40 : 60 in Malwa to about 80 : 20 in Nimar. Two selected strains of pure *desi* cotton, *Malvi 1* and *Malvi 9*, have been evolved for growing under *barani* conditions; both of these are superior to the mixture commonly grown. In addition, a strain of *Cambodia* cotton, known as *Indore 1*, has been developed for growing on the *adhan* lands. This strain has given good results under irrigation in parts of Jodhpur and Ajmer. In Rajputana, the extensive trials carried out on the Bikaner Gang Canal have shown that both *C. 520*, a *desi* cotton from the United Provinces, and Punjab-American *289F* and *43F* are promising. In both Indore and Dhar States a cotton seed distribution scheme is now being worked and is making good progress. Unlike last year when the *Malvi* cotton was declared by the mills to be very poor in quality, this year's cotton was good. All the available *Malvi 9* lint on the farm was readily sold at a premium of Rs. 2-4-0 per maund over the local cotton. The incidence of wilt on the farm is, however, becoming a serious menace. Every precaution is, however, being taken to prevent this position from getting worse by means of proper rotation and adoption of prophylactic measures. Wilt is present in the cultivators' fields also, but as their crop is usually a mixture of *desi* and American, and since wilt affects only the *desi*, its incidence is not so noticeable as in a pure *desi* crop such as *Malvi 9*. *Malvi 9* is not resistant, and the evolution of a resistant strain is now engaging the attention of the Institute. While arrangements have been made to multiply rapidly one of

the sub-strains from *Malvi 9*, which is partially resistant, hybridisation work has been started with immune types the seed of which was obtained from the Mycological Section at Poona. The multiplication of *Malvi 9* on the farm and on the cultivators' fields has now been confined to fields known to be free of wilt.

Cotton Variety Trials—Malva and Nimar.—The best of the Dhar *Malvi* selections were again tried against *Malvi 9* and its sub-strains at three centres : Indore, Dhar and Kharua. The results were very definite in that the best of the selections were only just as good as *Malvi 9* in yield. Both in lint length and ginning percentage there was a small difference in favour of *Malvi 9*. The new material obtained last year will now be studied.

For Nimar a large number of varieties including *banilla, jarila, Verum 434* and bulks of the best local selections were tried at two centres, Dhamnod and Kukshi. None of the varieties surpassed the local in yield in either place. While *banilla* is superior to the local cotton in ginning percentage and to *Verum* in quality, *jarila* has been found to be better in respect of both these characters. This being the first trial in which *jarila* was included, it will have to be repeated for two more seasons; should the results prove favourable, there will be a big scope for *jarila* cotton in this tract.

Seed Distribution.—Six hundred and eighty-nine maunds of improved cotton seed (632 *maunds* of *Malvi 9* and 57 *maunds* of *Malvi 9-20*) were collected during the year, mainly from the seed multiplication area in the villages surrounding the Institute. As a sufficient stock of *Malvi 9* seed has now been built up, further multiplication and distribution of *Malvi 1* seed was discontinued. Out of the above quantity, 17½ *maunds* were reserved for farm sowings, 44 *maunds* were distributed to contributing states for multiplication, and over 350 *maunds* were again distributed to the cultivators in the neighbouring villages. This area of nearly 1,400 acres under *Malvi 9* in these villages is directly under the supervision of the Institute. Periodical visits are made to rogue the crop and also to note the incidence of wilt, so that, when the cotton is brought to the farm by the cultivators, the produce from wilt infected fields is kept separate and not used for seed purposes. Of the 1938-39 crop, only the produce from the first and second pickings was bought by the farm, the later pickings being taken by the cultivators directly to the local market with a certificate that the produce is from crop sown with Institute seed. 785 *maunds* of *Malvi 9 kapas* was bought and ginned on the farm and 440 *maunds* of seed was reserved for distribution in 1939-40 season. It is gratifying to note that the local mills have begun to recognise *Malvi 9* cotton and are also volunteering their help to increase the area under this cotton as rapidly as possible.

Cotton Survey.—During the year, at the instance of the Committee, a survey of cotton in Baluchistan was undertaken. The import of cotton into the Kathiawar ports from the Makran coast is already prohibited to prevent the introduction of any new pests or diseases into India, but since part of Makran lies in Baluchistan, it was considered desirable to collect information

regarding the nature and extent of cotton cultivation in that area. The assistant who carried out the survey of Iran cotton was detailed for this work. In addition to surveying the Makran coast, he also visited the cotton areas in North Baluchistan. While in Makran the cotton grown is still *herbaceum*, in N. Baluchistan, the indigenous *herbaceum* has been completely replaced by Sind and Punjab Americans. A fair number of representative samples, both single plants and bulks, have been brought from Makran and examined at the Institute, but they do not appear to compare favourably as breeding material with similar material brought from Iran two years ago. The *herbaceum* grown in Baluchistan is neither earlier than nor superior to the Indian *herbaceums*. In so far as the incidence of pests and diseases is concerned the material brought was examined by the Imperial Mycologist and the Entomologist; stenosis was the only disease present to any extent and, among the insect pests, the chief were the two boll-worms, white fly and plant lice. It would thus appear that there are no pests or diseases present in Makran which are not already met with in India.

2. Research on Cotton Technology.

Research on cotton technology is carried out at the Committee's Technological Laboratory at Matunga. The Annual Report of the Laboratory is now issued as a separate publication, and here, therefore, only a brief summary is given.

A noteworthy feature of the year was the steady increase in the activities of the Laboratory falling within the scope of the Testing House which was inaugurated in 1937. 635 routine samples were received for tests during the year, representing an increase of 17% over last year's figure. The increase was most pronounced in the case of agricultural samples and samples for technological investigations.

In connection with the agricultural samples, a test which deserves special mention is that relating to comparative tests on *Umri Bani* and *Gaorani 6* to find out whether *Gaorani 6* can replace *Umri Bani* as a Standard Indian cotton. It was concluded that, if considerations of yield and ginning percentage permitted, cultivation by the farmers of *Gaorani 6* instead of *Umri Bani* would be a better paying proposition.

During the year, fibre and spinning tests were made on eight samples of Uganda strains supplied by the Senior Botanist, Bukalasa Experimental Station, Uganda. Similarly, tests were made on four samples of bleached and unbleached pulp supplied by the Ceylon Government for finding out the suitability of such pulps for the manufacture of card board, brown paper, white paper, etc. A large number of samples of lint, yarn and cloth were also received for tests from various firms. A sample of bleached yarn, discoloured by brown stains, was received from a firm to find out the cause of these stains and the ways and means of removing them. The tests carried out showed that the stains were due to the yarns having come into contact with rusty iron, either in the kier or in the packing cases and that they could

be removed effectively by a chemical treatment. A sample of cloth in which certain insects of a boring type had made holes was received from a mill and a formula for a protecting varnish was supplied to the mill, together with suggestions for storing the cloth in such a way as to obviate or greatly reduce the risk of similar damage. In connection with the investigation on the absorption of dyes by Indian cottons, a calorimeter employing the use of photo-electric cells has been designed at the Laboratory, and during the year two samples of cotton sent by a mill were tested with the help of this instrument to find out their absorption for direct dyes. Measurements of this type are important to the mills because the dyes being relatively more expensive, some saving can be effected by using cottons which, other factors being equal, absorb less dye than others.

The practical spinners are often confronted with the problem of predicting the test of cotton for a specified count from the known results of a count into which it has been spun. With the help of the data available at the Laboratory, this problem has been successfully solved by working out a suitable formula.

As cottons differ widely in the amount and nature of trash associated with them, the proper blow-room treatment for a cotton is a matter of great practical importance to a mill and this problem is being investigated at the Laboratory. During the year tests were completed on *Bengals* cotton and are now being made on Punjab-American *289F*.

Some time back an investigation was completed at the Laboratory in which a preliminary study was made of the spinning quality of staple fibre—cotton mixtures. As staple fibre is steadily gaining ground as a raw material which may be mixed with cotton and spun on cotton machinery, the scope of this investigation has been enlarged by using staple fibres covering a wider range of length and filament denier, and also by studying the optimum conditions of the treatment for mixtures of these fibres with suitable Indian cottons.

Samples are tested at the Laboratory under the following groups :—(*a*) agricultural samples, (*b*) samples of standard Indian cottons, (*c*) trade samples and (*d*) technological samples. (*a*) Agricultural samples represent either new or improved varieties under trial by Agricultural Departments or old types grown in connection with certain field experiments. The number of samples received under this head during the year under review was 305 against 281 last year. (*b*) The standard cottons mostly represent improved varieties grown on a commercial scale ; during the year, tests were completed on :—*Verum 262* (Nagpur), Late *Verum* (Nagpur), *V. 434* (Akola), *Verum 262* (Akola), Sind *Sudhar, umri bani, Cambodia Co.2* and Surat *1027 A. L. F.* and results published as usual. (*c*) The trade samples fall under two heads :—(*i*) those supplied by the East India Cotton Association representing the fair average quality of different varieties of Indian cotton which form the bulk of the cotton crop, and (*ii*) those supplied under arrangement with the Bombay and Ahmedabad Millowners' Associations representing the early arrivals of the

various Indian cottons into the local markets. Altogether 10 samples of the first category and 12 of the second were tested during the year and the results published in circulars which were distributed to the trade and industry in India and abroad. In addition, samples are tested for individual mills and firms on payment of fees ; the total number of such samples received for test during the year rose from 118 in 1937-38 to 145 of which 11 were for spinning tests, 49 for yarn tests, 39 for cloth tests, 8 for moisture tests, 36 for fibre tests and 2 for dye absorption tests.

In addition, trained Technological Assistants are stationed at Lyallpur, Sakrand, Lucknow, Surat, Dharwar, Coimbatore and Parbhani, in connection with provincial research schemes to help the cotton research officers in their work of cotton improvement. The annual expenditure on this account amounts to about Rs. 23,000.

His Excellency the Viceroy visited the Technological Laboratory on the 24th January 1939.

3. Cotton Research in Provinces and States.

A brief review of the research work financed by the Committee in the various cotton growing provinces and Indian States is given below.

Madras.

Pempheres and Physiological Scheme.—This scheme was sanctioned in 1925 for a period of five years, but, owing to difficulty in securing a competent plant physiologist, it had to be kept in abeyance till 1931, when it was decided to send, for training to England, two officers selected from the Madras Agricultural Department with a view to their eventually occupying the posts of Physiological Botanist and Biochemist under the scheme. In the meanwhile, preliminary investigations were started under the direction of the Cotton Specialist, Coimbatore.

The scheme, as originally sanctioned, consisted of two investigations, one for the control of cotton stem weevil (*Pempheres affinis*) and the other for the evolution of a strain in *karunganni* cotton resistant to the harmful effects of February rains. The first problem was pursued in three directions, botanical, bio-chemical and entomological. On the botanical side, the aim was to evolve a strain which would not allow the insect time to complete its life cycle inside the stem ; on the bio-chemical side the causes that made strains susceptible to the insect and the factors that helped the plants to resist its attack more efficiently were investigated ; on the entomological side, efforts were concentrated to survey the distribution of the insect and to explore the possibility of checking its spread by biological methods.

As it was felt that the possibilities of biological control were doubtful and that the bio-chemical research was also not a hopeful line of attack, the Committee, at its meeting in July 1938, decided that these two sections should be closed down on the 31st October 1938 and 31st August 1939, respectively.

The botanical research was, however, extended up to October 1941. The physiological investigation was also terminated on the 31st October 1938, as it was felt that the experimental work had been brought to a stage when further investigations could be continued by the Agricultural Department itself.

During the year under review, the three Brazilian types, *viz.*, *Quebradinho*, *Verdao* and *Moco*, which were found resistant to the attack of the stem weevil but seemed to suffer from certain handicaps from the economic point of view, were crossed and backcrossed with *Co. 2* and their progenies studied both at Coimbatore and Srivilliputhur. The results of testing 340 cultures at the latter centre showed that only one culture of *Moco* was completely immune to adult emergence or mortality whilst another showed 5% adult emergence with no mortality. Similarly, 833 cultures tested at Coimbatore showed that 14 cultures were equal to or better than *Co. 2* in respect of yield with 5% adult emergence and mortality. One culture, *viz.*, *7178*, however, has consistently shown high resistance during the last four years. Amongst the cultures tested for yield at Srivilliputhur and Coimbatore, Nos. *4413/3*, *4413/1* and *4151* were found to be statistically superior to the control *Co. 2*, while Nos. *7176/5*, *7178/1*, *7178/7* and *7178/1-2*, all derivatives from *Moco*, proved to be the best from the points of view of resistance to the weevil attack and mortality, the latter being below 5%.

From the bio-chemical standpoint, it has been established that gum formation occurs earlier and quicker in the Brazilian varieties than in *Cambodia* on account of changes in the water-soluble polysaccharides of the plant. An endeavour was made to find out the relationship between resistance and the amount of polysaccharides present, but the results obtained were not significant. On analysing the polysaccharides, the B amylase component showed a better relationship ; this was further confirmed by the absence of maltose in the larval guts and by the short life of the adults when fed on maltose.

Entomological.—The chief internal parasites of *Pempheres* were found to be *Chalcidoids*, spotted *Spathius* and *Dinarmus*. Other host plants, besides cotton, on which the pest was met with, were *Malvestrum*, *Hibiscus vitifolium*, *Hibiscus ficulneus*, *Sida actua*, *Sida glutinosa* and *Urena*.

The physiological investigations have shown the new strain *K. 1* to be best suited to withstand untimely rains. Strains *3999*, *72* and *110* are also stated to have given good results. Thick sowing of cotton has been found to improve the yield and to be beneficial under conditions of untimely rainfall.

Scheme for improvement of Mungari cotton in Madras Province.—This scheme was sanctioned by the Committee in 1937 and has for its object the evolution of strains suitable to the red soils and combining the quality of the *Westerns* with the yield of *mungari*, to replace the inferior *mungari*, the existence of which affords opportunities for mixing, with the result that the better cottons of the tract fail to get their proper value.

During the year under report, the season was abnormal, higher rainfall during the period of growth prolonging the pickings. The eight strains which were found to be equal to the local mixture last year were again tested in randomised blocks, replicated six times. Of these, five strains, *viz.*, *V. 434, 6042, X 4383* (*Cambodia* × *U. 4*), *M. 274* and *P. 26H* again equalled the local mixture in yield. Late *Verum, V. 434, P. 26 H, M. 274* and *X 4383* were tested at five places in the Bellary, Anantpur and Kurnool Districts ; in one place, the American strain, *X 4383*, proved distinctly better than the local *mungari*, while in the remaining four places its yield was equal to that of the local. In view of the very satisfactory performance of this strain in respect of both yield and spinning value (42's against 10's of *mungari*), arrangements were made for the multiplication of its seed and for observing its behaviour on a field scale. The reports received so far are stated to be encouraging and if these are confirmed in subsequent trials, it may be necessary to review the breeding work of the scheme so as to make suitable alterations in the future programme.

193 cultures, selected from promising families of last year, were split up into 38 sets and tested against local *mungari* in small randomised ' single ' row plots, replicated 2 to 6 times, according to the availability of the seeds. Out of these, 3 cultures were found to be superior and 9 equal to the control. Only 5 had staple length of 24 mm. and over and a ginning percentage of 31 and more and these will be carried forward to the next year. Some of the re-selections made from 49 promising cultures have been found to possess a staple length of 29 mm. and a ginning percentage of 34.

A study of the botanical composition of the *mungari* crop has revealed the predominance of broad lobed forms. In some localities, the proportion of *indica* forms has been found to be fairly high.

Nadam Cotton Breeding Scheme.—This scheme was sanctioned in 1933 with the object of securing one or two suitable annual types of cottons capable of replacing *Nadam* (*G. obtusifolium*), a perennial variety, in the red soil areas of Salem and Coimbatore districts where, due to poor soil and precarious rainfall, neither *karunganni* (*G. indicum*) nor *uppam* (*G. herbaceum*) can be satisfactorily grown. *Nadam*, being a perennial variety, serves as a breeding ground for pests like the stem weevil and pink bollworm during the close period of *Cambodia* prescribed under the Madras Pest Act.

Although the total rainfall during the year under report exceeded the average, the distribution was unfavourable and this acted adversely on the annual varieties of cotton ; the perennial *Nadam* type, however, benefited by the heavy summer rains and yielded well. 183 cultures were compared in replicated progeny rows. Of these, 148 were from the American varieties, made up of 46 cultures of the previous season and 102 selections from single plants in F_2 and F_3 generation of *Co. 2* × *Russian hirsutums*. Ten strains amongst these yielded more than 300 lbs. per acre but only three were found to be statistically superior to the standard. Out of the 35 Asiatic cultures tested, five yielded more than 300 lbs. per acre ; four of these were derivatives from *Nadam—karunganni* crosses. *Nadam* yielded only 80 lbs. per acre.

Two sets of Asiatic and American strains, each consisting of five strains, besides *Co. 2*, were tested for yield in replicated randomised blocks. The Asiatic strains, in general, fared better than the American; the *K. 1* strain from the former group giving a yield of 300 lbs. per acre and spinning up to 32s highest standard warp counts. It may be mentioned that the Department of Agriculture has been distributing the seed of this strain in the Coimbatore District and if the present standard of yield is maintained during the next two years, the object aimed at by the scheme will have been achieved.

BOMBAY.

Broach Cotton Breeding Scheme.—The original object of this scheme was to obtain by selection or hybridization, suitable types of cotton possessing wilt resistant, high yielding, high ginning and good spinning qualities to replace the local mixture in the Nerbudda-Mahi zone consisting in large part of *goghari* (a short staple variety which is susceptible to wilt but has a ginning percentage of 40). Strain *B. D. 8*, which is highly resistant to wilt, was crossed with several high ginning types and 14 successful crosses have been obtained. During the year under report, 9 of these were tested in replicated trials for wilt resistance, ginning outturn, fibre length, spinning capacity and yield. The seed of the best plant from each of the 9 segregates was sown in nine randomised replications, both in wilt-infected and wilt-free soil. Segregates *76-1*, *76-12* of the straight cross (*B. D. 8*×*G. A. 26*)-F_8 and *1-2*, *1-6*, *5-18*, *6-20* and *6-25* of the back-cross (*B. D. 8*×*G. A. 26-*F_1)× *B. D. 8-*F_6 together with four new crosses, *viz.*, *7-29-1-1*, *59-B-1-1*, *10-15-3-2* and *3-1-3*, were finally selected for bulk yield trials in the ensuing season.

Some promising selections were obtained from crosses of *B. D.* 8 with *57-1* and *N. S. 12* and the segregates (*B. D. 8*×*S. 7-1*)-F_6-*10-15-3-2*, [*B. D. 8*×(*B. D. 8* ×*S. 12-1-*F_1)] F_4-*3-1-3* and five plants from cross (*B. D. 8*×*N. S. 12*) F_4 with ginning percentage of 37.6 to 39.8 and staple length of 21.0 to 21.7 mm. have been selected for further trials.

Sixteen pure lines possessing specific economic characters were maintained by selfing.

A nucleus of pure seed of *B. D. 8* strain, which is being distributed in the district since 1935-36, was maintained.

Jalgaon Cotton Breeding Scheme.—This scheme was sanctioned by the Committee in 1932, with the object of securing, by selection or hybridisation, a commercially useful and highly wilt-resistant strain with good ginning and spinning qualities to replace *N. R.* or *banilla* in Khandesh. As a result of the work extending over five years, a variety known as *jarila* (*N. V. 56-3*) has been evolved and, during the past three years, this has been undergoing rigid trials and has been reported upon favourably.

27 plant selections of last year, isolated from the material obtained from the Amraoti District, along with 11 newer selections, were tested in progeny rows. Of the 120 plants selected from these, 41 were found to be superior to

the average *jarila* plant, in respect of staple length, ginning percentage and yield ; these will be grown in replicated progeny rows for testing their ability to resist wilt.

To introduce the character of immunity to wilt and high ginning percentage in *jarila,* the F_1 of the cross (*jarila* × *N.R.* 5) was crossed with *New Million Dollar*—a wilt immune strain and 51 successful crossed bolls were obtained, seed of which will be tested next year.

With a view to isolating a segregate equal to *jarila* in all respects but with a higher ginning percentage, the seeds from the F_1 plants of the cross jarila × *N. R. 5* will be grown next year and the F_2 population studied. About 50 F_1 plants of this cross were studied during the year under report to find out the extent of variability in their economic characters as compared with their parents ; *jarila* was found to have better staple but lower ginning percentage than *N. R. 5,* while in respect of yield, F_1 and *N. R. 5* were equal but superior to *jarila.* The variability in this character was very high in all the three cottons.

The testing of wilt-resistance of the more promising cultures in *jarila* and wilt-free samples collected from the district in the previous years was continued. Out of 86 plants from 19 cultures of last year grown in single rows, six plants were found entirely free from wilt and without any internal discoloration of the roots. These will be tested next year. None of the 201 wilt-free samples collected from the district, however, proved satisfactory.

In the extensive village trials conducted in 44 centres in Khandesh and part of Nasik District, the results in six places were vitiated due to natural or other causes. In the remaining 38 trials, *jarila* yielded more than the local in 16, gave nearly equal results in 10 and yielded less than the local in 12. Taken collectively, there was no significant difference between *jarila* and the local, though last year the difference was significant. The ginning percentage of *jarila* this year ranged from 33 to 38.

Both farm and commercial samples tested at the Committee's Technological Laboratory were adjudged suitable for 27 to 30 highest standard warp counts. Tests on 5 bales carried out at the Tata and Sassoon Mills, Bombay, however, gave 21 to 22 counts (average), with strengths varying from 50 to 70 lbs. The lint was valued at Rs. 16 to Rs. 45 over Broach by the Millowners' Associations of Bombay and Ahmedabad. The prices realised at the auction sales at Jalgaon in January and March 1939 ranged from Rs. 23 to Rs. 48 on Broach, for the farm and registered seed growers' produce.

A nucleus for producing 200 lbs. of selfed seed of *jarila* was maintained on the Jalgaon Farm during the year. The actual amount of selfed seed obtained was, however, only 178 lbs.

Scheme for improvement of Wagad cottons at Viramgam and Jagudan.— While examining the possibility of growing medium and long staple cotton in the short staple areas of India, the Committee in August 1935 decided that, in view of the absence of any serious attempt to improve the cotton of the

large *Dholleras* tract, a comparative study of Indian and Iranian *herbaceum* cottons should be undertaken, with the object of finding out one or more suitable types for the tract. A special officer from the Institute of Plant Industry, Indore, was deputed to Iran to collect *herbaceum* types of cotton grown there and, in August 1936, a five-year scheme was sanctioned for the improvement of *Wagad* and *Mathio* cottons, the work on *Wagad* cottons being centred at Viramgam and that on *Mathio* at Amreli. Simultaneously a small immune area was maintained at Jagudan under irrigation to safeguard the work at Viramgam.

The scheme commenced on 1st May 1937. The investigations are directed towards improving the *Wagad* cotton for (*a*) quality and yield and (*b*) earliness, in order to escape frost and to replace, if possible, the inferior *Mathio* cotton (G. *arboreum var neglectum*) of Kathiawar tract by early *herbaceums*. As a result of earlier work, a strain called *Wagad 8* has been evolved which has been found superior to the local in yield of seed cotton to the extent of 12%, and in ginning percentage to the extent of 3·6. It is equal or slightly inferior to local *Wagad* in spinning value and thus lacks one desired quality.

During the year under review, 104 selected plants from *Wagad* (representing 36 families) and 46 additional ones were grown in progeny row cultures. Of these, 17, which appeared equal to or higher than the local-*Wagad* in ginning percentage (though lower than *Wagad 8*), were retained for further trial. Most of these are superior to both in fibre length and some promise to be better yielders than *Wagad 8*. From the remaining cultures, 31 individual plants with a ginning percentage ranging from 35 to 46 and fibre length from 20 to 24 mm. were selected for next year's progeny-row test.

A replication test of ten families (bulk seed) of *Wagad* selections, with *Wagad 8* and local-*Wagad* as controls, showed that *85-2*, *N. 89* and *98-1* were significantly higher yielders than *Wagad 8* and local-*Wagad*. Of these, *N. 89* was found to be better for its longer fibre than local-*Wagad* with a slightly higher ginning percentage.

45 hybrid selections from crosses of *Wagad* types with *Surtee-Broach* quality cottons (*1027 A.L.F. and B.D. 8*) in F_4, F_5 and F_8 generations, were grown in progeny-row cultures. Of these, 4 cultures were found to be promising. From the remaining 11 cultures, 16 plants with a ginning percentage ranging from 37 to 45 and fibre length ranging from 20 to 23 mm. were selected for further trial and purification.

One more type of *Surtee* cotton, *viz.*, *22-3-1-3*, a derivative from *1027 A.L.F.* × *Jayawant* cross, known for its earliness and spinning 40 to 45 counts, with a ginning percentage of 32 and fibre length of 22 mm., has been crossed with *Wagad 8*. From the first back-cross, *viz.*, (*Wagad 8* × *22-3-1-3*)F_1 × *Wagad 8* F_1, 33 plants with bolls opening like *Wagad* and with a ginning percentage ranging from 38 to 45 and fibre length ranging from 21·1 to 23 mm., were selected for further study during the ensuing year.

With a view to replacing the inferior *Mathio* cotton of Kathiawar with early *herbaceums*, crosses were made between (1) *Wagad 8* and Russian *herbaceums*, (2) *Wagad 8* and Persian *herbaceums* and (3) *Wagad 8* and East Iran and early *herbaceums* from Trinidad. The F_1 generation of the above three was back-crossed with *Wagad* types *99*, *101* and *Seg. 4-1* and the back-cross population will be studied next year.

The varietal trial experiments with *Wagad 8*, *Seg. 4-1*, *Seg. 7-1* and local-*Wagad* showed that *Seg. 4-1* is distinctly superior to local-*Wagad* and *Wagad 8* in ginning percentage. It is as good as local-*Wagad* in yield of seed cotton per acre, but is inferior to *Wagad 8*. On account of its high ginning percentage, the lint yield per acre is equal to that of *Wagad 8* and about 23% more than local-*Wagad*. On an average, it is also slightly superior to local-*Wagad* in spinning value. In monetary return per acre, there is no difference between *Wagad 8* and *Seg. 4-1*, though both bring in about Rs. 5 more per acre than local-*Wagad*.

Twenty-two types of *Wagad* cotton from Viramgam were maintained by selfing at Jagudan. Three types gave promising results—two in respect of yield and one in respect of ginning percentage and fibre length. In the variety trial experiment, *Wagad 8* was found equal to local-*Wagad* in yield but gave 5% more lint on account of its higher ginning percentage. *Seg. 4-1*, though lower in yield than local-*Wagad*, gave about 7% more lint. In spinning value *Seg. 4-1* was found to be superior to *Wagad 8* and in a lesser degree also to the local-*Wagad*.

In another variety trial experiment with five varieties, *viz.*, *Kanmi-local*, *Chokadia*, *Broach 9*, *Seg. 7-1* and *Wagad 8*, *Seg. 7-1* proved to be the best in point of yield, ginning percentage and fibre length. The suitability of this strain for the *Lalio* tract, which represents about 25% of the area under cotton in the Mehsana district, will be tested in the ensuing year.

Scheme for breeding wilt-resistant cottons in Surat area.—This scheme was sanctioned by the Committee in August 1936 and commenced work in April 1937. The object of the scheme is to obtain a strain of cotton completely resistant to wilt and suited to the natural conditions obtaining in the Surat tract. This is sought to be achieved either by selection in *1027 A.L.F.* or by crossing this cotton with *B.D. 8* or other wilt resistant strains.

The testing work during the year under report was done in the specially wilt-infected plot at Shera. Out of the 950 plants of the composite cross $\{(B.D.\ 8 \times 1A.L.B.) \times 1027\ A.L.F.\}\ F_5$ tested, 15 plants with a ginning percentage of 35 to 40·1 and a staple length of 24 to 25·2 mm. were selected for further study. Out of the 203 plants studied in a non-infected field at Surat, 17 plants with a ginning percentage of 33·4 to 38·7 and staple length from 23·8 to 25·2 mm., were retained for testing their wilt resistance.

From the 38 plants of the composite cross $\{\{[(B.D.\ 8 \times N.S.\ 12) \times 1027\} \times 1027\} \times B.D.\ 8\text{-}B3]\ F_1$ grown at Shera, 11 plants with ginning percentage ranging from 29·7 to 37·5 and staple length varying from 22 to 25 mm., were selected for further study.

The progeny of 66 plants of *1027 A.L.F.* selected for wilt-resistance at Surat were tested at Shera. 57 selections proved completely susceptible and from the progeny of the remaining 9, comprising 432 plants, 12 plants were retained for further work as these did not show either root discoloration or any other symptom of wilt.

Four cultures of selection *4-1*, out of a lot of 14 selections grown in the wilt sick soil at Shera, were found to be promising and were retained for further study. Their ginning outturn varied from 37·5 to 38·1% and staple length from 21·7 to 22·6 mm. Two other promising selections, *10-1 and 23-2*, which were under trial at Surat and have a ginning percentage of 41 and 39·1, respectively, will be tested next season in the wilt infected plot at Shera.

Three new crosses (*8-1*×*K. F.*), (*8-1*×*N. S. 12*) and (*8-1*×*B. D. 8*) were made with the object of introducing high wilt-resistance, ginning percentage, good spinning quality and high maturity of fibre.

Six cultures of the back-cross $\{(B.\ D.\ 8 \times G.\ A.\ 26) \times B.\ D.\ 8\}\ F_6$ were tested at Surat for their economic characters, and 8 plants of culture, *1-6*, having a ginning outturn of 39 to 40·6% and staple length from 22·5 to 34·5 mm., were selected for testing next year in the wilt sick soil at Shera.

Scheme for Survey of Goghari Cotton in Gujerat. This scheme was sanctioned by the Committee in 1934 for a period of five years for carrying out a field to field survey of *goghari*, a short stapled variety, with a view to tracing it to ginneries and inducing the latter to discourage its cultivation by paying low prices for it. During the year under review, it was reported that, as a result of the passing of the Cotton Control Act of 1935, *goghari* had been completely eliminated ; the scheme was therefore closed down in March 1939.

Plant Puller Propaganda Scheme in Surat, Broach and Panch Mahals Districts. This scheme, which has for its object the eradication of the spotted bollworm by the uprooting of cotton stalks by means of plant pullers, was sanctioned in August 1933.

The year under review is the fifth year in which propaganda was carried out in the districts of Surat and part of Broach where a thorough clean-up campaign was not previously carried out. Intensive propaganda was conducted in Jambusar taluka of the Broach district where the campaign had not made good progress. In Surat district, the work was concentrated in the three *talukas* of Ankleshwar, Olpad and Chorashi where it had been widely taken up. The remaining *talukas* of Surat district were, however, not neglected. During the year, 465 plant pullers were supplied in the area north of the river Narmada and 955 in the tract south of it. The percentage of the area cleaned up before the 15th May 1939 with plant pullers, in Jambusar *taluka*, was 40%, as against 30% in the previous year, while, in the three *talukas* of Ankleshwar, Olpad and Chorashi, the percentage of area uprooted was 44, 65 and 61, respectively, as against 47, 77 and 62, in the previous year. In the remaining *talukas* of the Surat district, the percentage of area uprooted varied from 18 to 32. Due to continuous and heavy rains during the year,

the growth of the cotton crop was not vigorous, the stalks remaining thin and stunted and thus affording easy and convenient removal by *kudalis* instead of by plant pullers. This, it is reported, accounted for the lower percentage of the area uprooted by plant pullers compared with that of the last year.

Scheme for inclusion of Northerns and Westerns cottons in programme of work of Dry Farming Scheme at Bijapur. This scheme was sanctioned by the Committee in August 1936 and is the outcome of the recommendations of the Agricultural Research Sub-Committee, which, while considering the subject of the possibility of growing long and medium staple cottons in the short staple cotton areas of India, expressed the view that in short staple cotton areas like the Bijapur district in the Bombay Province and Raichur and Gulbarga districts in the Hyderabad State, where the rainfall is limited and precarious, a solution of the problem confronting the successful growing of medium and long staple cottons might be found in devising suitable dry farming methods. The scheme came into operation in June 1937.

The season during the year under report was excellent throughout the Bijapur district, the rainfall being nearly 25% above normal and its distribution favourable. The results of the experiments could not therefore be taken as conclusive. The work under the scheme was divided into two parts. In the first part, six replicated and randomised experiments were laid out to test the comparative performance of the four strains, *viz.*, *N-14*, *H-1*, *Jayawant* and the local-*Kumpta* and the effect on them of F. Y. M. and castor cake. The other five experiments were laid down to assess the value of different operations and treatments included in the Bombay Dry Farming method, *viz.*, tillage, bunding, interculture, spacing, rotation, fallowing and green manuring.

In the second part, *Northerns* and *Westerns* cottons were tried on a field scale under the Bombay Dry Farming method for comparison with the local cultivators' method.

Experiment 1 which was laid down to test the comparative performance of varieties supplemented by manures gave significantly different yields. Local-*Kumpta* and *Jayawant* were distinctly superior to *N-14* and *H-1*. *H-1* gave higher yield than *N-14* in contrast to the results of the last year, when *N-14* was found superior to all the three. F. Y. M. gave an increase of 14% over untreated ; castor cake did not prove effective.

Experiment 2 of which the object was to ascertain the advantages of three different types of preparatory tillage, *viz.*, ploughing, tine-tooth harrowing and blade-harrowing, gave no significant differences.

Experiment 3 which was designed to assess the value of bunding *versus* no bunding and the value of mulch over no mulch, in bunded and non-bunded plots, gave an increase of 3½% more yield in favour of bunding, the effect of mulch being distinctly negative.

Experiment 4 was laid down to determine the optimum plant population per unit area with different spacings. The results were not significant, but

the largest yield was obtained with nearest spacing or with higher plant population.

Experiment 5 was laid out to ascertain the advantage of rotating cotton with *jowar* over cotton year after year. The results were not significant though cotton after *jowar* gave 9% more yield than cotton after cotton.

Experiment 6 was designed to assess the value of fallows, *viz.*, (1) clean fallow in the previous year followed by cotton, (2) cover fallow, *i.e.*, *sann* green manured fallow in the previous year followed by cotton and (3) cotton followed by cotton. None of the treatments was found to be significantly superior to the other two. Cotton after cotton, however, gave higher yield than the two fallow treatments.

In the large scale field trials of *Northerns* and *Westerns* under the Bombay Dry Farming method, the highest yield was obtained when all the six treatments enumerated above were combined. Addition of F. Y. M. resulted in increasing the yield of two cottons by more than 75%, or more than 230 lbs. per acre as compared to that of the local cultivators' method. The improved treatment without manuring or ploughing showed no difference over the local method.

Scheme for interspecific hybridisation in cottons at Surat. This scheme was sanctioned by the Committee in January 1938 for a period of five years with the object of obtaining, if possible, fully fertile hybrids between Asiatic and American cottons, combining the useful agronomic characters of both, particularly, the good staple length of the American and hardiness and adaptability to Indian climate of the Asiatics.

Prior to the commencement of the scheme, work on crossing Asiatic and American cottons was undertaken at Surat in 1932, with the result that 23 hybrids had been obtained, in which the American parents used were mostly of the acclimatised *Upland* from different parts of India, while the Asiatic parents were *G. herbaceum* and *G. arboreum*. The hybrids produced from these were, however, sterile and efforts to induce fertility in them were successful only when they were back-crossed to American types. As a result, 27 first back-cross plants were raised successfully, 15 of which were found to be more or less fertile. By crossing *Co. 2* (*G. hirsutum*) with Red *arboreum* (*G. arboreum*) and back-crossing the *F1* to *Co. 2*, one plant, *viz.*, *B. C. No. 22*, was obtained, which was found to be fully fertile, combining the characters of both the parents.

During the year under report, all original 23 hybrids were maintained as ratoons and propagated vegetatively by cuttings and graftings. The hybrids, though vigorous and flowering profusely, were sterile and to bring about fertility in them, three methods were tried, *viz.*, (1) back-crossing, (2) physical treatment and (3) chemical treatment. Nearly 1,53,000 flowers of the hybrid plants were back-crossed and gave 43 bolls with 55 seeds. The second method failed to give the desired results. The chemical treatment, known as the "Drop and Immersion" method of applying colchicine to growing buds and tips of shoots, had only a temporary effect, though retardation

of growth and marked thickening of leaves of the affected parts of the plant were perceptible in the initial stages. This chemical, however, when tried on germinated seeds of *1027 A. L. F.* and *1A Long Boll*, for inducing doubling of chromosomes to facilitate easy cross fertilisation, gave promising results. The treated plants have formed a few bolls and the seeds, if obtained, will be tried next season. The progress of this experiment is being watched with great interest. Another chemical known as acenapthene, which is considered as potent as colchicine in inducing doubling of chromosomes and subsequent fertility in interspecific hybrids, is also being tested.

With a view to obtaining high quality cottons, fresh crosses of *Sea Island* and *Egyptian* with *1027 A. L. F.*, have given 33 bolls with 49 seeds which will be studied further. A rigid study of the morphological and economic characters was made in (1) 27 back-cross plants, (2) the selfed progeny of 5 back-cross plants, (3) the hybrid progeny of some of the back-crosses crossed with *Maarad* and (4) reciprocal crosses of No. 3. Out of 2,700 plants grown, 300 plants were selected for laboratory examination, of which 76, with a range of 18.3 to 38.7 ginning percentage and 21.8 to 31.7 mm. staple length, were finally selected for further study.

A number of crosses were made within species and between different wild and cultivated species to produce artificial amphidiploids, for use in crossing and to test the supposed theory of amphidiploidal origin of the New World cultivated cottons.

Sind.

Scheme for Cotton Jassid Investigation.—In Sind, Jassid attack is most prevalent in the south-east Thar Parkar district where it is proposed to establish a compact block of long staple cotton. One of the harmful effects of this pest is improper development of the seed, so that, in certain seasons, good seed is not available for sowing purposes, and this gives a setback to the extension of improved varieties. This scheme was sanctioned by the Committee in August 1937 for a period of three years and six months with the object of studying the habits of Jassids, their alternate hosts and the manner in which certain varieties of cottons resist Jassid attack. The scheme was put into operation in May 1938.

During the year under review, the biology of the pest and its comparative infestation on different cottons were studied. Two species of the pest were found to attack cotton and other crops. The first, *Emposca devastans dist.*, which is readily recognised by the presence of two small black spots, one on each side of the apical end of the tegmen, is found largely on cotton, *bhindi* (*H. esculentus*), *brinjal* (*Solanum melongena*) and Potato (*Solanum tuberosum*). The other species may be *Emposca formosana, paoli*, in which the black spots are absent. It mainly occurs on *guwar* (*Cyamopsis psoraloides*), *wal* (*Dolichos lablab*), cowpea (*Vigna catjang*) and berseem (*Trifolium alexandrianum*). The female of *Emposca devastans dist.*, lays her eggs in the veins of cotton leaves. The egg is oval in shape and dull white in colour. The period of egg laying varies between four to six days in hot weather and extends up to 15

days in cold weather. The maximum capacity of egg laying may be near about 26. The nymphal life is found to vary from 7 to 8 days from August till the end of October. Nymphs of all instars pass their life on the under surface of the leaves and moult five times prior to reaching the adult stage. The maximum life of adults is 27 days during summer and 50 days during winter. These live by sucking the juice of leaves, have wings and are capable of flying and spreading infestation from one field to another. The females seem to exercise considerable discrimination in laying eggs both on cultivated and wild hosts. Leaves, in which veins have hardened, or become tough and leathery, or which possess hairs, are discarded for egg laying.

A study of the relative abundance of the pest on the important cultivated varieties of cotton in Sind, *viz.*, Sind *Sudhar*, 4*F. 98*, *Sea Island*, *Boss III-16* and *Sind N.R.*, was undertaken and it was found that all the varieties were susceptible, the intensity of attack varying in different varieties. Though Sind *Sudhar* and 4*F. 98* had a greater attack than *Sea Island* and *Boss III-16*, their general growth and yield was better. *Cambodia*, which was included among the varieties studied, had the lowest number of jassids ; its growth was quite good, but yield very poor. Among *deshi* cottons, Sind *N. R.* was found to be less susceptible. *Parbhani-American* and *buri AK Special* were found to be less attacked, like *Cambodia*. There seems a possibility of utilising these three varieties for crossing with Sind *Sudhar* and 4*F. 98*. Observations made on the comparative infestation of Sind *Sudhar* and 4*F. 98*, when sown on different dates, showed that the attack was least in the early sown than in the late sown crop.

Jassid adults were found in very small numbers on chillies, tomatoes, grape vines, mulberry, lucerne, *abutilon*, beet and *khurasa*, a wild species of *Hibiscus*.

Scheme for investigation into Black-headed Cricket in Sind.—This scheme was sanctioned by the Committee in January 1938, for a period of three years, with the object of establishing the identity of the pest, and studying its life history, seasonal behaviour and the extent of damage caused by it. Before the opening of the Lloyd Barrage, the Black-headed Cricket had been known as an occasional pest of *sorghum* and cotton in Upper Sind and some parts of the Punjab. With the introduction of cotton cultivation on the Right Bank of Indus, however, this insect has become a serious pest of cotton in the seedling stage in Khirtar and Johi tracts in Sind and in some parts of Baluchistan. The pest appears in the cotton fields towards the end of April and disappears in June. The period of its activity synchronises with the sowing time of cotton and causes almost wholesale destruction of the orop. The pest appears to belong to the same species as met with in Baluchistan, *viz.*, *Gryllulus domesticus*.

The scheme started late in the season, at a time when the pest is not found to be active in the fields. A thorough survey of the affected tracts has, however, been made and the various types of crickets found, collected.

PUNJAB.

The Punjab Botanical Scheme.—The chief object of this scheme, when it was sanctioned in 1925, was to investigate the causes of the periodic failures of American cotton in the Canal Colonies where a large area is annually grown under such cottons, and to obtain suitable types of American and *deshi* cottons to replace *4F* and *deshi* cottons respectively. In view, however, of the immediate economic importance of improved types of cotton, work was concentrated on breeding and a separate Physiological Scheme was sanctioned for investigating the problem of periodic failures of American cotton.

The principal feature of the year under review was the spread of the improved *deshi* and American cottons over large areas. Among *deshi* cottons, strain *39 Mollisoni* covered an estimated area of about 300,000 acres and is now regarded as the premier *deshi* cotton of the province; so far there is no other *deshi* cotton which can compete with it either in yield or ginning outturn. Next in order comes *119 sanguineum*, which is eminently suited to the South Western portion of the Province, *viz.*, the districts of Multan, Muzaffargarh and Dera Ghazi Khan. Its chief merits are early maturity, high yield, high ginning percentage (35-36) and drought resistance.

Amongst American cottons, *289F/43* which has established itself as one of the leading varieties of Punjab-American cottons, occupied an area of 100,000 acres. Its chief merits are early maturity, drought resistance and high yield which is better than that of *4F*.

Attempts are being made to improve the staple of *deshi* cotton by crossing Punjab *Mollisoni* with *Chinese Million Dollar*. With a view to combining the desirable characters of two or more strains into one, hybridisation work is in progress. Special mention in this connection may be made of the cross made between *289F/43* × *C. B. S.* for evolving a strain with long lint, high ginning outturn and naked seed.

Preliminary variety trials of all new strains were conducted at the Risalewala farm. The best of these will be tested again in the ensuing year.

In the varietal trials of American cottons, carried out at a number of places, *289F/43* was found to be the best, while *124F* proved suitable for both Multan and Khanewal. In the varietal tests with *deshi*, *39 Mollisoni* gave the best all round performance. Among other new strains, *116* and *138 Mollisoni* appear to be promising, the latter being a particularly good ginner. Among *D. C.* strains, *D. C. 17* and *D. C. 26* deserve a mention.

Varietal tests of both *deshi* and American cottons conducted at Multan Sub-Station showed that *sanguineums* are better suited to the Multan tract than *Mollisoni*; the American strains *124F* and *127F* fared better than *289F/K. 25* and *289F/43*.

Two multiple factor experiments, one involving varieties, date of sowing, and fertilisers and the other varieties, date of sowing, spacing and nitrogenous manure, were carried out ; the results showed that :—

(*i*) *289F/43* was significantly better than *L.S.S.*,

(*ii*) 1st June was definitely a more suitable time for sowing than 1st May,

(*iii*) a combination of N & K was definitely better than no manure or complete artificial manure,

(*iv*) the interactions between the varieties and the sowing dates, between varieties and manures, and between manures and sowing dates were insignificant, and

(*v*) the interaction between varieties, manures and sowing dates was significant.

During the year, 38,500 bales of *289F/43* and 1,13,333 bales of *39 Mollisoni* were produced, the profit realised by the cultivators being estimated at Rs. 93,750 and Rs. 7,50,000, respectively.

Physiological Scheme.—Partial failures of the American cotton crop in the Punjab occurred in the years 1919 to 1921, 1926 to 1928, 1931 and 1932. The external symptoms of the cotton plants during these failures were early reddening and shedding of the leaves, premature opening of the bolls with immature seeds and low quality lint and, in extreme cases, the dwarfing of the plant. To account for these failures, various views were advanced, such as, the heat stroke theory (Milne 1924), attack of White Fly (Roberts, 1929) and unfavourable combination of climatic and biotic factors (Trought 1931). As, however, these theories could not be supported by sufficient data, it was thought that these failures were due to malnutrition of the plant. A physiological scheme was accordingly started in March 1935 to study the physiology of the cotton plant with a view to determining, if possible, the nature of the nutritional disorder known as '*Tirak*,' the causes underlying it and finding out measures to remedy it.

The work of the last four years has indicated that two sets of soil conditions are associated with the development of '*Tirak*', (1) soils which contain alkali salts in the subsoil from the 2nd or 3rd foot downwards and (2) soils with extreme nitrogen deficiency. These conditions may exist either separately in separate fields or together, the intensity varying from field to field. Plants growing on soils of the first type are normal till July, but later exhibit symptoms of drought. The recovery from wilting after each irrigation is of short duration. By the beginning of September, the leaves begin to shed ; there is also considerable shedding of flowers. The bolls found are few ; they crack and are found to contain immature seeds. In soils of the second type, the growth of the plant is luxuriant when the soil is light sandy loam. Starvation symptoms appear at the bolling stage when the leaves turn yellow and red and are shed. The size of the new leaves is comparatively reduced. The number of bolls produced per plant is normal but they crack and contain

immature seeds. In very heavy soils, containing alkali salts in the subsoil, the growth, though normal for a few weeks, is later suppressed. The plants remain stunted and possess dark green leaves which show symptoms of drought. Premature defoliation of leaves and later '*Tirak*' occur. The weight of *kapas* per boll is reduced to 1.0 to 1.5 gram, the normal weight being more than 2 gms.

'*Tirak*' is found to appear in its most serious form on sandy soils with alkali salts in the subsoil; such soils are also deficient in nitrogen. The bolls are small in size and open badly. The weight of *kapas* per boll is found to be as low as 0.5 gram.

'*Tirak*' occurs in a less serious form on sandy soils deficient in nitrogen. In such soils, alkali salts are not present. The weight of *kapas* per boll is found to fluctuate between 1.5 to 1.8 grams. The nitrogen content of the leaves falls below normal early in the month of September. Deficiency of nitrogen in the leaves is also accompanied by a deficiency of other important nutrients, like potash and phosphorous, even though they are not deficient in the soil.

Tannins are produced in leaves with low nitrogen content. Their presence in the leaves, which can now be easily detected by a simple method specially devised, can safely be regarded as an index of nitrogen starvation. If nitrogen in the form of sulphate of ammonia is applied to a crop when the test for tannins is given by the leaves, it is found to recover within eight days after application and the appearance of '*Tirak*' can be prevented.

'*Tirak*' on the first type of soil with the alkali salts cannot be ameliorated by the application of manures, which only results in vigorous growth. It can, however, be successfully ameliorated by sowing the crop about the 3rd week of June. By sowing late, vegetative growth of the plant is considerably cut down, its demand for water in August and September is considerably reduced, it does not suffer from physiological drought and there is no premature shedding of the leaves. The plant escapes injury during the most important period of its life and is able to function normally. The bolls are well formed with normal weight of *kapas*, the roots remain active at that stage which is not the case with the early sown plants and no symptoms of '*Tirak*' are produced. The yield is also considerably higher than that of the May sown plants which get 'diseased' on such soils. Closer spacing of plants than the normal practice of 3 feet distance between the rows is essential in the case of the late sown crop.

'*Tirak*' on sandy soils deficient in nitrogen can be remedied by the application of nitrogen in the form of sulphate of ammonia. No internal or external symptoms of the disease develop and there is no bad opening of the bolls. The yields of *kapas* are greatly increased by the application of sulphate of ammonia to such soils.

It is possible that the fields, where the two adverse soil conditions mentioned above exist together, can be ameliorated by late sowing, coupled with the application of nitrogen. This is being investigated at present.

Late sowings of cottons in the Punjab, apart from being a remedy for the '*Tirak*' disease, appear to be a physiological necessity, as revealed by the growth studies made so far. June sown crop appears to be better adjusted to the environment than the May sown crop, and consequently, its efficiency for *kapas* production is greatly increased as compared with the efficiency of the early sown crop on normal soils. This point too is under investigation.

Scheme for improvement of Punjab-American 289F cotton.—This scheme was sanctioned in January 1938 for a period of 5 years with the object of purifying and improving the Punjab-American *289F/K25* cotton which was evolved at the British Cotton Growing Association Farm some years ago and is a very popular cotton in parts of lower Bari Doab Canal Colony. The area under it has expanded considerably but no effort has been made to keep it pure from the botanical point of view.

During the year under review, several single plant selections as well as *F1* hybrids from *289F/K25* × *289F/43* cross were examined and a large number of selections made. *289F/K25*, being susceptible to jassids, was crossed with *289F/43* and *F1* progenies were grown at Khanewal. All the *F1* plants were very hairy but their resistance could not be tested as the season was exceptionally dry and the jassid population low in the province in general and near about Khanewal in particular. The *F1s* were back-crossed with *289F/K25* in order to retain a greater proportion of its characters in the progeny.

Rogueing of the general crop of *289F/K25* was carried out at the British Cotton Growing Association Farm to purify the present commercial crop with a view to improving it by judicious selection.

Agronomic experiments, *viz.*, variety trials and a multiple factor experiment involving varieties, spacing and small quantities of artificial manures were carried out but as this was the first year of such experiments no conclusions can be drawn.

Root Rot Scheme.—This scheme, which was sanctioned in 1932, is concerned with the investigation of root rot in the Punjab, where, particularly in the canal-irrigated areas, the annual damage done to cotton by this disease is estimated at several lakhs of rupees. Both *desi* and American varieties are equally affected by the disease which makes its appearance towards the end of June and continues up to the middle of September. The organisms responsible for the disease are *R. bataticola* and *R. solani*.

During the year under review experiments were conducted to determine the effect of soil temperature on the incidence of the disease and it was observed that the incidence was reduced on lowering the temperature in the case of *R. solani* but not to any material extent in the case of *R. bataticola*. The progress of the disease was also observed to be checked under conditions of high humidity and low temperature. Cotton grown mixed with *sorghum* tended to show lower incidence, as *sorghum* appeared to reduce the air temperature and raise the

humidity. An attempt was made to test the effect, on the incidence of the disease, of changing soil reaction (which is normally alkaline), by the addition of lime and sulphur. The results were, however, found to be negative. Cottons sown early in April and those sown late, after the middle of June, suffered least from root rot mortality and the yield obtained from these sowings was quite satisfactory. If such sowing is supplemented with certain pre-sowing cultural operations, like ploughing, removing the diseased debris, manuring or heavy irrigations, the yield of early and late sown cottons is found to be much higher and the incidence of the disease reduced to a negligible degree in comparison with May-sown cottons.

The addition of certain fertilisers, such as, potassium or calcium chloride, appears to help in reducing the mortality and increasing the yield.

A large number of varieties obtained from various important cotton growing countries of the world were tested under heavy conditions of infection but none of them was found to be resistant to root-rot.

Scheme for Cotton Jassid Investigation.—This scheme was sanctioned by the Committee in March 1937. Its object is the study of the jassid insect in the Punjab as regards its habits, alternate host plants and characters of the plant which determine resistance to the pest.

The chief feature of the year was the extremely mild attack of the pest throughout the province. Comparative population of jassids on different varieties of cotton, *viz.*, *Jubilee*, *289F/43*, *289F/K.25*, *4F*, *L. S. S.* and *100F*, was recorded by the 3 methods mentioned in the last year's report. The largest number of jassids (both adults and nymphs) were observed on *289F/K.25* and the least on *Jubilee* cotton. The highest jassid population was recorded in the beginning of September on all the varieties, when it declined rapidly and continued low till the end of the season. Late sown cotton was comparatively more infested than the early sown one. The percentage of oviposition was less on *deshi* strains than on Americans. Highest number of eggs was laid on *bhindi*. No variety, either *desi* or American, showed any difference in respect of hatching of eggs laid on it. Nymphs of all ages were able to develop equally well on all varieties and there was no resistance to feeding. The effect of a severe jassid attack on plants resulted in a marked suppression of vegetative growth. The production of floral forms and yield were also reduced without any effect, however, on the opening of bolls.

The pest infests other host plants, besides cotton, such as, *Hibiscus esculentus* (*bhindi*), *Solanum tuberosum* (*potatoes*). *Solanum melongena* (*brinjals*), *Althea rosae* (*hollyhock*). *Bhindi* continues to be severely infested in spite of the presence of other hosts *Brinjals* and *potatoes* help the pest in tiding over the period between two cotton seasons. The lowest jassid population in the fields was observed in January, February and March.

Caged plants of *Tanguis* × *U4* cotton were tested for resistance and the results showed that the insect could not do any damage to the plants when ordinary muslin cages were used, but the effect was disastrous with cages with thicker type of covers, thus showing that the resistance in cotton plants is associated with their vigour.

The Punjab Clean-up Scheme.—This scheme which was sanctioned in March 1937 is the outcome of the Punjab Entomological Scheme which successfully terminated in March 1937. Its object is to deprive the Spotted Bollworm of its food during January-April in a compact area immediately after the last picking is over and to study the effect of this measure on the yield of *kapas.*

During the year under review, a compact area of 500 square miles, comprising 183 villages in Lyallpur and Jhang Districts, was selected for the removal of cotton stalks with *kudali* (a modification of Lantana *kudali* from Mysore). All other host plants were also carefully eradicated from this area. The effect of these clean-up measures on the incidence of the Spotted Bollworm was studied from June to December, and it was found that the pest was practically absent in the cleaned area during the period of growth of cotton between June and July. During August-December, the Spotted Bollworm population in the treated area was 2-3 times less in the case of *desi*, and 3-4 times less in the case of American cotton as compared with that in the uncleaned area. Night-caging observations also showed that the difference in the yield obtained from caged and uncaged plants in the cleaned area was considerably less and that there was a great similarity in both sets of plants with regard to the number of bolls opening and the weight of *kapas* picked. It was also seen that in the cleaned area the average number of bolls picked per plant was higher by 6 bolls than in the uncleaned area. Further, it was observed that the quantity of damaged cotton in the treated area was half of that in the untreated area.

A clean-up campaign was again organised, in 1938-39, to deprive the Spotted Bollworm of its food during January to May. These operations were repeated in the same 183 villages of Lyallpur and Jhang Districts in which they were carried out last year. The actual removal of cotton stalks was started in January 1939, and by the end of March 1939, the entire area was cleaned. Cotton stalks from 92% of the total area under cotton in the treated zone were removed with *kudali* but those from the remaining 8% of the area were cut with *toka.* After a shower of rain in the second week of February, the fields where *toka* was used were thoroughly ploughed and cotton stumps carefully removed. *Abutilon indicum* was also destroyed and measures were successfully adopted to insure against the cultivation of *bhindi*, hollyhock *gulkhera* and early cotton in the area under clean-up operations.

Central Provinces.

Botanical Scheme.—This is one of the earliest schemes of the Committee and one that has yielded results of practical value. It commenced in 1923, was renewed in 1929, again in 1933 and terminated on 31st March 1939.

The main work under this scheme was concerned with the breeding of new strains of cotton suitable to the conditions obtaining in the various cotton growing areas of the province and especially capable of resisting the handicaps imposed by wilt and other diseases. In addition, only such other crops were worked at as experience showed to be suitable rotation crops for making the growing of cotton a permanent success. Many other features bearing on the improvement in efficiency of cultivation, harvesting and utilisation of by-products have also been investigated.

The first cotton to be evolved under the scheme was *Verum 262*. Being a pure line selection for wilt resistance, it fulfilled the immediate requirements of the time, and was a considerable improvement over *roseum*. With a ginning percentage of 32 and capacity to spin 20's to 22's highest standard warp counts, it gave a lint yield which on wilted land was unquestionably higher than that of *roseum*. Experience, however, showed this cotton to be susceptible to variations in climatic conditions which rendered estimation of its cropping power a difficult matter owing to wide fluctuation in yield from year to year. A cotton that would be suitable for growing in the districts of heavier rainfall to the east of Berar and in the Central Provinces where the monsoon lasts till rather late in the season was thus the immediate need of the moment and this was provided by the successful development of late *Verum* from the original resistant material of *Gossypium neglectum verum*. While progress of these two strains was carefully watched in the field, investigations were continued for the finding out of a strain of indigenous cotton which would serve as a good all-round type suitable for growing anywhere in the province. By 1933, the fixing of such a type became possible and led to the development and multiplication of *V. 434*, the chief merit of which lies in its adaptability to varying conditions of soil and climate. It is a strain which possesses, in addition to wilt-resistant qualities, drought resistance, prolific flowering capacity, quickness in forming buds and setting fruit, comparative freedom from shedding and excellent lint characters and good ginning percentage. With a staple length of nearly 1 inch, this cotton has been adjudged suitable for spinning 32's to 37's highest standard warp counts—a great advance over the 8's of *roseum* and 20's of *Verum 262*. The premium which this cotton obtains more than compensates for its slightly lower ginning percentage as compared with *jari*. *V. 434* is thus the best all-round type available at present—hardy, prolific and superior in quality—and the existing varieties are being gradually replaced by it. In view of the all-round suitability of *V. 434*, and the desirability of having as few types as possible in adjacent areas, the Agricultural Department recommends that, except in places where another strain shows a distinct superiority over *V. 434*, the latter type alone should be grown.

The chief feature of the year under review was the success which attended the cultivation and expansion of *V. 434* which again showed its superiority over all other types of cotton grown. There were some 63,700 acres under it during the past year—grown from seed supplied by or raised under the supervision of the Agricultural Department. There is reported to be a great demand for the seed of this cotton, not only within the province, but also from outside.

Another important item of the work was the development and comparative trial on a field scale of the four new strains of *Gossypium indicum, viz., B. 61, B. 64, B. 73* and *B. 90* on the various Government Farms. Besides being resistant to wilt, these possess fine, long lint which is capable of giving the best spinning performance attainable in an Indian cotton. The work of single plant selections from the original pure stock of *Verum 262*, late *Verum, V. 434, bani 306, E. B. 31, buri 84* and *buri 107* was continued with the object of eliminating, if possible, any defects observed and to isolate new forms possessing greater ginning percentage and higher yields. From the cross *bani* × *cernuum*, four new strains, *viz., H. 413, 414, 415* and *420* possessing high yield, disease resistance and superior lint qualities were isolated. These will be tested against *V. 434* during the next season. Late *Verum* was grown over an area of 10,000 acres in the east of Berar and parts of the Central Provinces where the monsoon lasts till rather late in the season. *No. 438* was again found suitable for the lighter types of soil. Improvement work on *buri* cotton was continued. Of the three strains of *buri, 107, 84* and *AK Special, 107*, gave the best performance in the Burhanpur *tahsil*. The most promising single plants from the *F4* generation of *buri 103* × *Lone Star* (*G. hirsutum*) were selected with the object of isolating long linted, high ginning pure strains. The interspecific cross between *H. 407* isolated from (*G. arboreum var neglectum forma indica* × *G. cernuum*) and *buri* (*G. hirsutum*) was maintained.

United Provinces.

The United Provinces Botanical Scheme.—This scheme was sanctioned by the Committee in January 1938 for a period of five years and was put into operation in August 1938. The scheme is concerned with the development of improved strains of Bengal cottons for the rain-fed and irrigated tracts of the United Provinces from the material collected in the course of the recent survey of cottons conducted in Rohilkhand and Bundelkhand and the investigation of the possibilities of growing long staple cottons in the Pink Bollworm controlled areas.

During the year under review, the crop suffered from scanty rains in some parts and incessant rains in others. The irrigated areas, however, produced average crops. The experiments at Cawnpore and Belatal failed entirely on account of heavy and protracted rainfall.

Detailed examination, purification and replicated trials of the material derived from the original 25,000 single plant survey collections were carried out at Cawnpore (representing the central area of the United Provinces), Raya (representing the western part of the United Provinces), Nagina (representing the Rohilkhand tract) and Belatal (representing the Bundelkhand tract). From the material of 1933-34, five best strains were tested against the existing standards *C. 402* and *C. 520* cottons; three of these have been selected for further study. Ten other strains were also tested on a small scale.

From the 1935 material, ten of the best families were examined against the standard types and one of these was found to be significantly superior to the standard type. 23 of the best strains from the 1936 material were tested against the standard and only the most desirable plants possessing high yield, good ginning outturn and fibre length have been selected for further trials. The 1937 survey material has given 17 promising selections which will be studied further.

Amongst the eleven *C. 402* selections, one gave significantly higher yield over the standard type. Results of *C. 520* selections did not show any significant differences.

Extensive varietal trials of *C. 520*, *C. 402*, *Malvi 1*, *Verum 438* and *Perso-American* were carried out under dry and irrigated conditions in the Pink Bollworm controlled and uncontrolled areas. These have shown the general superiority of *C. 520* and *Perso-American* at most centres and the unsuitability of *Verum 438* and *Malvi 1* at all centres. The results, however, cannot yet be regarded as being conclusive. *Perso-American* appears promising, if sown about the middle of May with irrigation in areas of deficient rainfall.

BENGAL.

Comilla Cotton Scheme.—This scheme was sanctioned in February 1933 and came into operation in December 1934. The object of the scheme is the botanical and systematic study and improvement of the commercial grades of *cernuum* cotton and the isolation of a coarse, high ginning and good yielding strain, suitable for mixing with wool. During the year under review, 28 single plants were grown in progeny rows from the stock of last year. These were multiplied in different blocks, replicated six times and examined for their economic characters. A progeny of 18 single plants was selected from the bulk material of the previous year and randomised under two types of cultivation, one being the terrace system advocated by the Department of Agriculture and practised at the Rangamati Farm, and the other the *jhum* system. The value of these selections under the two systems is being studied, and it is hoped that some useful results will become available next year. The first survey material collected in 1937-38 was sown during the year under report and, out of 2,200 plants examined, 838 were selected for propagation. Most of the plants belong to the indigenous types and suffer from the defect of being low ginners. An intensive search for the right type of plant is being made.

HYDERABAD.

Botanical Research Scheme at Parbhani.—Hyderabad is the third biggest cotton growing territory in India and some years back had the reputation of producing one of the finest indigenous cottons, *viz.*, *gaorani* or *bani*. This long staple variety, however, suffered from the defect of being a low ginner with the result that it has now been largely replaced by high ginning short

staple *neglectums*. In 1929, the Committee, realising the importance of this large cotton tract, sanctioned a botanical research scheme known as the Hyderabad Botanical Research Scheme at Parbhani, the object of which is to study the several varieties of cotton grown in Hyderabad and to secure from them high ginning, medium staple types to replace the existing varieties in different parts of the State. A large number of improved pure strains has been evolved under the scheme, amongst which *gaorani 6* is the most outstanding.

During the period under review, preliminary tests on 300 new selections of medium staple *gaorani* and about 100 of slightly shorter staple were carried out at Parbhani. *Gaorani 4B-5* was adopted as 'control' for the former and the local variety of Parbhani, for the latter. 14 progenies were selected, on the basis of yield and other characters, for inclusion in comparative tests next season. A similar preliminary test with 150 single plant progenies against the local variety carried out at Latur gave about 60 progenies. Another test with 76 progenies against the local variety carried out at Madhol gave 30 progenies with higher yields than the local variety. These will be tried in the next season. About 600 new selections were made from the cultivators' fields in the *Gaorani Protected Area* and from the plants grown at the Research Station from seed samples from different villages. Of these, 200 were reserved for further tests.

The experiments on varietal tests carried out at Parbhani and at the Variety Testing Stations at Latur and Madhol with *gaorani* local and four improved strains, *viz.*, *gaorani 3B-1*, *gaorani 4B-5*, *gaorani 6* and *gaorani 113*, resulted in *gaorani 4B-5* and *gaorani 3B-1* giving a significantly higher yield than the local. Of the other two strains, *gaorani 6* gave almost equal yield, while *gaorani* 113 gave even lower yield than the local.

Besides *gaorani 4B-5* and *gaorani 6* mentioned above, four new strains were tested against *gaorani-umri* at Parbhani with the result that *gaorani 4B-5* was found equal to *gaorani 117* and both *gaorani 4B-5* and *gaorani 6* gave significantly higher yield than the four new strains.

The second series of varietal tests was conducted at the Government Experimental Farm, Parbhani, and at the Cotton Research Station, Parbhani, but none of the improved strains excelled the local in point of yield.

A comparative test of 24 medium staple strains against *gaorani-umri*, conducted at the Cotton Research Farm, Parbhani, showed that 17 strains were better in respect of yield and fibre length than *gaorani-umri*. One of these strains, *gaorani 127*, which possesses the longest fibre was selected for inclusion in the next year's varietal test.

Another comparative test with 13 *gaorani* strains was conducted at the Variety Testing Station, Latur, against the local. The crop suffered heavily from excessive rains with the result that the local variety gave the highest yield. A similar test with 13 *gaorani* strains and the local *gaorani* was carried

out at Madhol, resulting in *gaorani 6E-3* giving a higher yield than the local. Amongst the new strains, *gaorani 6E-3* gave significantly higher yield than the rest excepting *gaorani 113* and *gaorani 143*.

21 medium staple strains were tested against the short staple local variety at the Cotton Research Farm, Parbhani, with the result that 5 strains gave significantly higher yield than the local. Of the other four promising strains, two were found to possess a longer fibre and a higher ginning outturn than the short staple local variety.

Among the 13 strains tested for wilt-resistance, strains II-37-4222 showed a high degree of resistance. The test on 140 single plant selections from the wilt plots of the previous year along with 58 resistant types grown in single rows gave 7 types with a mortality of 5% or below and 17 types with a mortality ranging between 5 and 7%. Ultimately wilt-free plants showing good yield and no internal discoloration of roots were selected for further study.

At the Government Farm, Rudroor, *Parbhani-American 1*, *Hyderabad-American 8* and *Havri 3* (a *roseum* selection) gave significantly higher yields than all the *gaorani* strains included in the experiment.

During the year under review, 3,120,000 lbs. of seed of *gaorani 6* were distributed over an area of 200,000 acres in the Nirmal *taluka* of Asifabad district and the Madhol and Bilol *talukas* of Nanded district. As the crop suffered badly from heavy rains, the net area cropped was estimated to be only 110,000 acres. The production amounted to 5,300 bales, *i.e.*, an average yield of only 65 lbs. of *kapas* per acre. The entire produce was ginned, pressed and sold under State supervision and it was estimated that the growers of *gaorani 6* realised O. S. Rs. 1,10,000 more than they would have done from the local variety. Nearly 4,415,000 lbs. of pure seed were purchased by the Department of Agriculture for distribution in the current season in a compact block of about 275,000 acres.

Pink and Spotted Bollworm Scheme.—This scheme was started in January 1933 with the object of determining (*a*) the actual amount of damage done by the pink and spotted bollworms to the cotton crop in the Godavary Valley, (*b*) the progress of their attack on the growing crop in the season, (*c*) the mode of their carry-over from one season to another and (*d*) the effect of the likely control measures.

The observations on the incidence of the two pests on the cotton crop at the Main Farm, Parbhani, showed that during the year under report damage, to the green forms by both the bollworms was rather low till the end of October. This low incidence, especially of Spotted bollworm, was due to heavy showers of rain during the previous months. In November and December, a gradual increase in the percentage of damage by both the pests was observed, the damage being more in the late maturing variety, *gaorani 12*, than in the early maturing *gaorani 6*. The crop was harvested in six pickings, the last being taken on 2nd January 1939. Due to abnormal weather conditions, the bulk of the crop was finished in the first four pickings. The last picking, which formed

only two per cent of the total crop, contained 54 per cent damaged and 24 per cent useless locks. However, when this was mixed with the other pickings, the quality of the total crop was lowered. By a judicious fixing of the date of the last picking and by ignoring the small quantity of cotton in that picking, the clean-up measures can be given an earlier start and at the same time the number of caterpillars that go into the resting stage in the soil can be reduced. The observations on the time of effective carry-over of Pink bollworm through soil generally indicated :—

(1) that the Pink bollworm caterpillars start going into hibernation in soil from towards the end of the cotton season,

(2) that their number in soil increases if the plants are allowed to stand in the field for a longer period,

(3) that more caterpillars are met with in the examination of soil made before the middle of April and

(4) that the variety of cotton, stand of the crop and the nature of the soil play an important part in the number of caterpillars going into the resting stage in soil.

The observations, made for the first time during the year, regarding the effect of early grazing of plants followed by repeated grazing up to the time of removal of cotton stalks from the field, on the number of caterpillars going into the soil for hibernation, did not show any conclusive results. The crop in two out of three plots was not uniform while the third plot had a bed of *morrum* at 4″ to 6″. Due to unfavourable rains, the crop came to an early finish. However, the results of one plot out of three showed that such grazing minimises the number of caterpillars going into the soil. Conclusive results can only be obtained in a replicated experiment laid out in a plot of good and uniform growth.

Hyderabad Bollworm Clean-up Scheme.—This scheme, which is the outcome of the investigation conducted on the bollworms of cotton during the year 1931-37, was sanctioned in August 1936, but owing to administrative difficulties it could not be put into operation before the 1st October 1937.

The research carried out at Parbhani has shown that the Pink and Spotted Bollworms are together responsible for a loss of 25 to 33 per cent of the annual crop, the newly developed, early maturing strains of *gaorani* suffering markedly less than the existing commercial variety. The Spotted Bollworm passes from one cotton crop to the next by continuing to breed either on cotton plants left standing in the fields after the final picking, or on alternate host plants of *bhindi* (Lady's fingers) and *ambadi* (*Hisbiscus cannabinus*) grown as garden crops during this period. The Pink Bollworm either remains active on the standing cotton plants till the first week of May or goes into hibernation from October onwards. It has been found also that unlike the case in the United Provinces, the Punjab and Egypt, very few larvæ of Pink Bollworm hibernate in seed. Most of the hibernating larvæ exist either amongst the fibres of *kapas* or in the cracks that are so characteristic of black cotton soils after the end of the rainy season.

From these findings the following steps appeared the most likely means of controlling these pests :—

(1) cultivation of an early maturing variety of cotton ;

(2) complete removal of cotton plants from the fields as soon after the final picking as possible ;

(3) completion of ginning of all *kapas* at least six to eight weeks before the sowing of the new crop ; and

(4) prohibition of the growing of *bhindi* and *ambadi* as garden crops in the off season.

In order to test these measures a part of Nanded district, comprising 230 villages and having nearly 91,000 acres of cotton every year, was selected for experimentation. The work which was started in October 1937 included :—

(1) the study of the incidence of attack on green forms in the new crop of the cleaned and untreated areas of the previous year,

(2) the analysis of the ripe crop of the same tracts for damage by boll-worms in 1938-39,

(3) the complete clean-up of cotton fields in the Control Area,

(4) the prevention of growing of *bhindi* and *ambadi* in the off season, and

(5) the completion of the ginning of all *kapas* before 30th April 1939.

Due to a low carry-over of Pink Bollworm from 1937-38, adverse weather conditions in 1938-39 and markedly early maturation of the new crop, the attack of the pests on the 1938-39 crop was distinctly low in both the cleaned and untreated areas and showed only a little difference between the two tracts. The analysis of the ripe crop also gave similar results, the damage by bollworms being much less in the early than in the late maturing crop. The clean-up work was carried out successfully for a second time. In addition to the difficulties met with in 1937-38, the unusual compacting of the soil in 1938-39, and the economic distress of the cultivators militated against a very early clean-up. In much of the area, the clean-up work was completed by 30th April. To overcome the inability of the existing type of blade-harrow to remove green plants effectively, a modified harrow-blade was devised and given a preliminary trial, with the result that the green plants were removed more effectively than by the implement at present in use; but further trials on an intensive scale are needed. An experiment to determine the effect of early and late clean-up on the hibernation of Pink Bollworms in soil was started. The first examination of soil in the early and late cleaned areas revealed but little difference in early and late cleaned plots, except in one locality, where the crop was removed late and the soil showed a greater hibernation. Further examination of soil in these localities is in progress. The ginning of all the *kapas* in the Control Area was completed before the 30th April and success was also achieved in the prevention of growing *bhindi* and *ambadi* in the off season. Also, a preliminary trial with different kinds of vegetable crops was carried out to determine their suitability as substitutes for summer grown *bhindi* and *ambadi*. *Palak, kulfa,*

chandanbatwa and *guvar* were found to give the best results; *kulfa* and *chuka* are likely to find favour with the farmers. The effect of the control measures on the incidence of bollworm attack in the forthcoming season will be studied. The investigation of the effects of the early and late clean-up on subsequent infection and the yield of the new crop will also be taken up.

Scheme for inclusion of Northerns & Westerns Cottons in Programme of work of Dry Farming Scheme at Raichur.—This scheme, which was sanctioned in March 1937 and renewed in July 1938, has a two-fold object, *viz.*, (1) to consider the possibility of growing medium and long staple cotton in short staple areas in India, and (2) to find out how far the devising of dry farming methods would go hand in hand with the successful growing of such cottons in the dry and low rainfall tracts of the country.

The work during the year under review was carried out on the same lines as in the previous year with the necessary modifications suggested by the Committee. The following four experiments were under study :—

1. manurial cum varietal experiment,
2. tillage experiment,
3. bunding experiment, and
4. observations to test the superiority of varieties.

In experiment 1, the highest yields were obtained with oil cake followed by "F. Y. M." The local variety gave the maximum yield closely followed by *H1* and *N. 14.* This was, however, contrary to the observations of the previous year when *N. 14* gave the highest. This may possibly be due to the smothering or dominating effect of the other two varieties and the small size of the experimental plots. The results were not statistically significant either for the manures or for the varieties.

In experiment 2, deep ploughing gave the highest mean yields. Next came blade-harrowing and lastly the tine-tooth cultivation. Difference in yield between the blade-harrowing and deep ploughing treatments, however, were not significant, due perhaps to optimum conditions of rainfall.

In experiment 3, bunding showed an increase of 6½% in the mean yields, over no bunding, but as the experiment was not statistically significant, no definite conclusions can be drawn.

In experiment 4, *N. 14* gave the highest average yield as before. Two strains of Kumpta cotton, *R. K. 19* and *R. K. 15*, were included in the varietal tests; *R. K. 19* gave the highest yield followed by local, *R. K. 15*, *H. 1*, *N.14*, *Jayawant*, *New Jayawant* and *Gadag No. 1.* The experiment will be repeated on bigger plots during the next season.

Scheme for the improvement of Kumpta Cotton.—This scheme was sanctioned in August 1936 for a period of five years and came into operation in

November 1937. It has for its object the development of suitable strains of Kumpta cotton from the local variety of Raichur.

The work done during the year consisted largely of properly conducted comparative tests with the most promising new strains, their parents and the two imported types, *Hagari* and *Jayawant*. Of the new strains included in the varietal tests, *Raichur Kumpta 15* gave a significantly higher yield and greater ginning outturn than its sister strains, *Raichur Kumpta 19* and *Raichur Kumpta* 27, and all these three strains were superior to *Hagari* and the local variety in respect of yield. *Raichur Kumpta 19* maintained the lead in spinning performance, the next in order being *Raichur Kumpta 15* and the local variety. Six strains of local *Kumpta* were found to be promising; *Raichur Kumpta* 25 and *Raichur Kumpta 29* did well in the previous year also. In a preliminary test, nearly 60 single plant progenies exceeded the local variety in yield. Preliminary tests were also undertaken to study the behaviour under Raichur conditions of *New Jayawant* and a wilt immune type from Bombay, and *K. 1*, *Nandyal 14* and two *Cambodia* selections from Madras. The best of these, *K. 1* and *Nandyal 14*, will be tested again along with others during the next season.

BARODA.

Baroda Root Rot Scheme.—This scheme which has for its object the study of the root rot disease of cotton in Baroda and the production of strains resistant to it was sanctioned in July 1931 and came into operation in February 1932.

During the year under review, *K. S.* progenies from the last year's material were tested for root rot resistance in a glass-house. Crops like *bajri*, rice, *sann* hemp, *variali*, *tur*, which are usually sown mixed with cotton were rotated with the latter and also sown in alternate rows with cotton to study their protective effect on the disease. The results are not yet available. Twelve of the best *K. S.* families were selected and replicated five times in May and June. In families Nos. *15* and *22A*, progeny differences were found to be significant. Best plants showing higher resistance, good yield and other economic characters have been selected for inclusion in the next year's trials. Sixty of the best *karkhadi* plants, including new selections, were grown in a progeny row trial both in May and June, but the results did not reveal any significant differences. Sixty individual plants consisting of 50 of the best *K. S.* plants were grown in non-replicated progeny rows in May with alternate rows of *Broach 9* as control and selections made for inclusion in progeny row trials next year. 11 bulks of *K. S.*, with Local *Broach 9*, as control did not show any significant differences between the bulks, though the majority of the latter were superior to the Local *Broach 9*. Three of the best bulks of *karkhadi* were tried for yield with *karkhadi* Bulk and *Broach 9* as controls. The results did not show any significant differences between different bulks, but they were all superior to the local.

Scheme for survey of Goghari Cotton.—This scheme was sanctioned in August 1934 for five years and came into operation in February 1935. Its object is the same as that of the Gujarat Goghari Survey Scheme, *viz.*, the

elimination of *goghari*, a short staple variety, by means of field to field survey with a view to tracing it to ginneries and inducing the latter to discourage its cultivation by paying low prices for it.

During the year under review, the cotton crop in 83,746 *bighas* was surveyed. This showed a total calculated area of 121 *bighas* to be under *goghari* mixture, *i.e.*, 0.2% of the entire area surveyed. The range of mixture varied from 1 to 2%. Out of 8,986 cultivators in 120 villages, fields belonging to only 594 showed admixture of *goghari*, in an area of 5,289 *bighas*. Propaganda work was continued along the lines of the past year.

The object of the survey has been well served ; a sustained propaganda and careful field to field investigation coupled with the enforcement of the Cotton Control Act, 1935, have helped to check this menace to the reputation of the Navsari cotton.

Plant Puller Propaganda Scheme.—This scheme, which aims at the eradication of the Spotted Bollworm by the uprooting of cotton stalks by the use of the plant puller was sanctioned in August 1934 and came into operation on the 1st January 1936.

During the year under report, the number of plant pullers sold in the Baroda District and the Navsari District was 2,767 and 1,750, respectively, and the area handled amounted to 162,000 acres and 334,373 *bighas*, respectively. The percentage of the uprooted area was 38 to 60 in the Navsari District against 24 to 80 in the Baroda District.

Scheme for improvement of Mathio Cotton at Amreli.—This scheme, which was sanctioned in August 1936 for five years and put into operation on the 1st June 1937, has for its object the improvement of *Mathio* mixture in respect of yield, ginning percentage and quality and the trial at Amreli of the early strains of *Wagad* evolved at Viramgam with a view to replacing, if possible, inferior *Mathio* by early *herbaceums*.

During the year under review, out of the 40 high yielding *Mathio* selections with a ginning percentage of 35 and above and staple length of 18 mms. and above were grown in replicated progeny rows, and the best ten types, superior to ordinary *Mathio* in yield, ginning percentage, or fibre length were selected for further trials. Similarly, 7 additional selections with a ginning percentage ranging from 34.9 to 36.2 and staple length from 17.2 to 18.9 mms. were selected from 100 non-replicated progeny rows. Three hundred field selections, with a ginning percentage ranging from 23 to 40 and fibre length varying from 14 to 25 mms., were made from the *Mathio* tract of Kathiawar. Out of these, 18 were selected for testing during the next year,—13 having a ginning percentage of 34 and above and fibre length 19 mms. and above and 5 having special character of high ginning and longer fibre. Persian cotton selections from last year failed under the local conditions of Amreli.

Replicated tests of 7 varieties, *C. 520, N. R., jarila, banilla. V. 434, V. 438* and *Mathio*, showed no significant differences between the yields of the important varieties, *viz., C. 520, jarila, banilla* and *Mathio*. Owing to

abnormal season, the yields were very poor and therefore of no comparative value. *C. 520* and *banilla* ginned higher than *Mathio* but in spinning value *banilla* and *jarila* were found to be much superior to *C. 520*, *N. R.* and *Mathio*.

BIKANER.

Bengals Cotton Improvement Scheme.—The opening of the Gang Canal under the Sutlej Valley Scheme resulted in the colonization of a new and virgin area, known as the Gang Canal area, with immigrant peasants, mostly from the Punjab, who were accustomed to the cultivation of the Punjab *desi* and American types of cotton. These cultivators found it difficult to successfully cultivate cotton under local conditions, evidently because the new environment was not quite the same as they were accustomed to in the Punjab. It was even feared that the area under cotton would be seriously reduced. This scheme was, therefore, started in January 1931, for the purpose of studying the local problems of the agriculturists and for obtaining by selection and hybridisation one or more superior types of cotton suitable to the locality. Until 1934, the botanical work was confined to the testing out of a large number of outside varieties, both *desi* and American. After that year, however, extensive survey of the Rajputana tract was undertaken to collect breeding material; at the same time, extensive trials of the few selected cottons from outside were continued to test their suitability to the tract. Agronomic work was pursued intensively from the beginning of the scheme. At the end of the first five years, it was found that *Cwn. 520* was the most profitable cotton to grow in the tract and that American cottons were generally unsuitable because of their low yield and susceptibility to disease. Also the staple of Punjab-American cottons was found to deteriorate both in length and strength when grown under Ganganagar conditions. A large amount of data and useful information regarding sowing times, seed rate, frequency and distribution of irrigation, optimum spacing for the *desi* and American cottons, rotation and manuring have been collected.

Since 1934, greater attention has been paid to selection and breeding problems; the results obtained so far are summarised below :—

(1) Re-selection in *Cwn. 520* has yielded strains which show much better germination and possibly also a little higher yield than *Cwn. 520*.

(2) Some of the local selections have proved better yielders than *Cwn. 520*, but are poorer in quality.

(3) It appears doubtful whether mere selection would improve the quality of the *desi* cotton.

(4) Breeding tests have shown that there are possibilities of improving the quality by hybridization. As regards cottons that may be used as parents, the set *Cwn. 520* × *bani* appears to offer the best chances of achieving the desired results.

(5) For the last two years *P. A. 289F* has done as well as *Cwn. 520* but it suffers from immaturity of the seed.

(6) In a variety *cum* agronomy experiment, interesting results have been obtained which show that the *desi* cotton (*Cwn. 520*) can respond as well as the American to more favourable conditions—liberal watering and manuring, etc.

During the year under review, selection work was undertaken in *Cwn 520* to ascertain if its inherent defective germination can be improved. Two sub-strains of *C. 520* were obtained with better germination under field conditions, but they did not maintain their superiority during the year for some inexplicable reason. None of the selections from the local survey material was found to be superior to *Cwn. 520* in yield and quality. The first lot of material from Rohilkhand and Bundelkhand survey was examined during the last three seasons and two or three selections from it appear to be slightly better than *Cwn. 520* in yield, but not in quality. From the bulk trials in progress, the best will be selected for replacing *Cwn. 520*. The results obtained so far, however, do not show much chance of a better quality cotton being found by selection from the local material. The cross between *Cwn. 520* & *bani* has given the most promising breeding material for the improvement of quality and the best of the selections are being tried under replicated progeny row tests. Some of these will be available for trial on a field scale in the course of the next two seasons. Preliminary tests were undertaken to compare local and imported seed of three varieties of cotton, *viz.*, *C. 520*, *Mollisoni* and *Punjab 289F*, which showed differences in germination and seed weight. Comprehensive trials are being undertaken to confirm these results. In an agronomic experiment with manuring and irrigation, the imported *289F* gave significantly longer lint than the local which was, however, found to be superior to *Cwn. 520*.

In the variety trial experiment with 5 American and 7 *desi* cottons, *P. 289-F/47* gave an outstanding performance and there is a possibility of this cotton replacing *P. 289F*, if further trials confirm the results so far obtained. None of the *desi* cottons come up to *Cwn. 520* in yield and quality. *Jubilee*, a definitely better quality cotton, was found to be a poor yielder. The *sanguineum* types, though eminently suitable for the tract in other respects, were found to be the poorest in quality. The premium realised by the cultivators by growing *Cwn. 520* is estimated at annas 8 per *maund* of seed cotton or *Rs.* 4 per acre.

MYSORE.

Mysore (*Doddahathi*) *Cotton Scheme.*—This scheme, which was sanctioned in February 1935 and came into operation in November 1935, is concerned with the breeding, from the local (*Doddahathi*) or American cotton, of suitable types, resistant to "Red Leaf" disease which stands in the way of expansion of this crop in the Irwin Canal area in Mysore State.

During the year under review, observations made on the incidence of the disease on different varieties at the Irwin Canal and Hebbal Farms showed

that the incidence differed with each variety; those that appeared resistant under irrigated conditions proved susceptible under dry conditions. *M. A. 2* and *Co. 2* were found to be less susceptible than other varieties tested. The study of the effect of different seasons on the disease revealed that the incidence varied from year to year even for the same variety. October and early December were recorded to be the peak months of the disease for all the varieties during the year. Observations made during the last two seasons showed that the date of sowing has an important influence on the final yield of the crop. In the varietal tests laid out in six randomised blocks with 7 varieties, *M. A. II* gave a significantly higher yield than the others. In order to select the best variety and determine the best time for its sowing, varietal trials were laid down, in nine monthly sowings, in randomised blocks, with 12 varieties and six replications, on the Irwin Canal Farm; similar tests with five varieties and five replications were made on the Babbur Farm. The most promising varieties and the best time of sowing will be selected and tested in a combined trial. 120 primary selections of *M. A. II* were made for yield and disease resistance. 4 selections in *Co. 2* have given a ginning percentage of 38 to 40. A few selections were made in *Co. 920*, *1267*, *1742*, *289F 38* and *M. A. IV*. Some of the Iraq, Iran and Turkestan cottons come up well and their seeds are being multiplied. In the demonstration plots, *M. A. II* as a dry crop, gave a very high yield with a total rainfall of 5". This strain withstands the attack of "Red Leaf" to a greater degree than others. This disease resistant character appeared to have been inherited by it from its *peruvianum* parent. Several crosses between *G. peruvianum* and promising *hirsutums* and *Sea Island* will be made during the next season. During the year, a few fresh crosses and a large number of back-crosses were made with a view to combining, if possible, the desirable characters of two or more strains into one.

Germinated seeds irradiated for 7½ minutes (65 K. V. P. 10 M. A. distance 6 inches) have in their fourth generation given plants with a ginning percentage of 38-40 and a lint length of 25-28 mm.

CHAPTER III.

SEED DISTRIBUTION AND EXTENSION SCHEMES.

For a considerable period the grants made by the Committee were restricted to agricultural research, but in 1929 it was decided that the time had come to add support to the efforts already being made to bridge the gap between the experiment station and the cultivator, and to supplement the funds which the Agricultural Departments were devoting to the introduction of improvements into agricultural practice. Special attention has since been devoted to seed distribution schemes, and to the more extended distribution of pure seed of improved varieties of cotton. During the period under review, there were seventeen seed distribution and extension schemes in operation in the various cotton growing provinces and States ; a brief report on the working of these is given below :—

1. MADRAS.

Madras Co. 2 Scheme.—This scheme was sanctioned by the Committee in August 1932 for a period of five years for the distribution of *Co. 2* seed in the Salem and Coimbatore districts through the agency of the Tiruppur Co-operative Trading Society by organizing a seed multiplication area of not less than 6,000 acres and distributing enough pure seed for 1,00,000 acres every year. The scheme closed down on the 17th August 1937. In January 1938, the Committee considered proposals for the extension of the scheme, but sanctioned a grant of Rs. 1,728 for one demonstrator and one *mistry* to help the Tiruppur Co-operative Trading Society for a period of one year, after which, it was thought that no further assistance from the Committee should be required. During the period under review, there were 3,200 acres under seed farms and the production of seed amounted to 10,758 *maunds** as against 5,350 acres and 52,584 *maunds** of seed during the previous year, the fall in acreage and production being due to the failure of seasonal rains and consequent damage to the crop. Aided by natural spread, the entire *Cambodia* tract in the Coimbatore district is now reported to have been covered by *Co. 2* strain. The premium obtained per 784 lbs. of *Co. 2* cotton over local *Cambodia* ranged from Rs. 5 to Rs. 12-8 in the year 1938 against Rs. 10 in 1939. The gain to cultivators is calculated to be not less than Rs. 15 per acre over the local variety. In November 1938, the Committee extended the *Co. 2* scheme for distribution of *Co. 2* seed in Salem district for a further period of four years and five months at a total cost of Rs. 85,201, of which the Committee's share was to be Rs. 63,357 and that of the Provincial Government Rs. 21,844. The Madras Government have, however, decided to postpone the operation of the scheme till the cultivators are better educated to the advantage of pure seed.

Maintenance of nucleus of pure seed of improved varieties of cotton, Co. 2, H. 1 and K. 1.—This scheme was sanctioned by the Committee in January 1938 at an annual cost of Rs. 610 for a period of five years and it came into operation in September 1938.

*1 Maund=24⅔ lbs.

2. Bombay.

Surat Scheme.—This scheme was first sanctioned in 1929 for two years. In December 1931, it was extended for another two years pending the final decision of the Committee on the cotton policy in the Surat area. In January 1934, after a thorough examination of the relative merits of *1A* and *1027 A.L.F.*, the Committee finally decided in favour of the latter and extended the scheme for five years for the distribution of *1027 A.L.F.* seed in the Surat area. In November 1938, sanction was accorded to the extension of the scheme for a further period of one year and again in August 1939 for three years from the 1st April 1940. The total amount so far sanctioned by the Committee is Rs. 1,18,410. During the year under report, the Department of Agriculture controlled a seed multiplication area of 11,756 acres (including 864 acres grown with farm pedigree seed) against 26,618 acres (including 1,160 acres with farm pedigree seed) in the previous year and distributed 19,63,486 lbs. of seed (including 9,42,862 lbs. supplied to Indian States) against 29,36,110 lbs. (including 16,60,449 lbs. supplied to Indian States) in the previous year. As a result of the amendment of the Bombay Rules under the Cotton Transport Act, 1923, restricting the importation of inferior types of cotton into the Surat tract, there was a good demand for *1027 A.L.F.* seed which was further enhanced owing to the increase in the import duty on foreign cottons, with the result that fairly reasonable prices for this cotton were obtained and stocks easily disposed of.

Khandesh (Jarila) Scheme.—This scheme was sanctioned in March 1937 for a period of ten months in the first instance, pending settlement of the policy regarding the apportionment of the cost of schemes between the Committee and provincial Governments and States. On the settlement of this question, the scheme was extended in January 1938 for a period of one year and in November 1938, further extension of three years was granted. The total grant sanctioned for the scheme by the Committee amounts to Rs. 1,02,125. The object of the scheme is to replace *banilla* in the Khandesh tract with *jarila*, which is wilt resistant, over an area of about 1,55,000 acres. During the year under report, 97,990 lbs. of *jarila* seed were sown over an area of 4,836 acres, against 6,868 lbs. over 390 acres last year. The natural spread of this variety is estimated at 5,000 acres. 5,19,257 lbs. of pure seed were purchased and stocked for distribution during the next season. *Jarila* is reported to have given an average yield of 269½ lbs. per acre against 229 lbs. of the local variety. 2,311 *docras* (about 1,100 bales) of cotton were ginned under departmental supervision and sold by auction at a premium of Rs. 38 to Rs. 48 *on* Broach, against Rs. 26 to Rs. 46 *on* Broach, obtained in the previous year.

Deccan Canals (banilla) Scheme.—This scheme, which was sanctioned in January 1934 for a period of five years, came into operation in April 1934. Its object is to supply pure *banilla* seed in the irrigated tracts in the Sholapur, Poona and Ahmednagar districts. It was hoped that the scheme would be self-supporting, but its working up to the end of 1938-39 showed a loss of Rs. 4,115. In August 1939, a further extension for five years was sanctioned

at a net cost of Rs. 6,000, the Committee meeting 75% of the cost of staff amounting to Rs. 1,312, and the Provincial Government bearing the remaining Rs. 4,688. During the year under review, 51 acres and 20 *gunthas* were under cotton and 24 acres under groundnut at Kopergaon Government Farm. A yield of 534 lbs. of *kapas* per acre was obtained against 368 lbs. per acre in the previous year and 678 lbs. per acre in the year before. The cotton crop was affected by uneven rainfall distribution, attack of green caterpillars, red cotton bugs, pink bollworm and growth of weeds. Comparative trials of *banilla* and *jarila* gave yields of 760 lbs. and 774 lbs. per acre, respectively.

B.D. 8 Scheme.—The scheme, which has for its object the distribution and extension of *B.D. 8* cotton, was sanctioned in August 1935 for a period of three years, and came into operation in December 1935. It was extended in July 1938 for a period of five years. The total grant so far sanctioned by the Committee for this scheme amounts to Rs. 47,501. During the year under report, 14,294 acres were under *B.D. 8* as against 6,268 acres in 1937-38 and 20,012 acres in 1936-37. The total area under cotton in the Broach district (excluding Ankleshwar *taluka*) is 250,000 acres. 10,208 bales of pure *B.D. 8* were produced and sold through sale societies and gin-owners at premiums ranging from Rs. 30 to Rs. 54 *on* Broach. Last year 2,035 bales were produced, of which 1,770 bales were sold through sale societies and gin-owners. The controlled area during the year was 7,096 acres from which 2,89,420 lbs. of seed were obtained. These, together with 4,864 lbs. obtained from the Surat and Broach farms, will be distributed to growers in the 1939-40 season. 2,69,420 lbs. of seed have already been distributed; in addition, 1,66,120 lbs. of seed were supplied to the cultivators in Kaira and Panchmahals, and also in Baroda State.

Revised Jayawant and Gadag No. 1 Scheme.—This scheme, which was sanctioned in August 1935, for a period of five years, replaced five seed schemes in the Southern Division of the Bombay province, *viz.*, the Hubli, Gadag, Athani, Haveri and Bailhongal schemes. It came into operation on the 1st June 1936, the aim being to eliminate local mixtures and to introduce pure *Jayawant* and *Gadag* cottons in the Southern Division of the Bombay province, so as to cover within five years, 9½ lakhs of acres with these cottons. The scheme is operated from seven centres, *viz.*, Hubli, Haveri, Navalgund, Bailhongal, Athani, Bijapur and Bagalkot, through the agency of co-operative societies under the general control of the Agricultural Department. Since 1st April 1939, however, the control of all seed schemes in the Bombay province has been placed under the Registrar of Co-operative Societies and Director of Rural Development. Decentralisation is the keynote of the scheme, the idea being that no single agency should have too great an area to cover or too great a responsibility to shoulder. During the year under report, 30,99,320 lbs. of pure *Jayawant* seed were sown over an area of 3,24,197 acres, against 27,55,200 lbs. of seed sown over an area of 2,45,318 acres last year. The natural spread of *Jayawant* is estimated at 1,75,000 acres, bringing the total area under this variety to about 5,00,000 acres. 11,29,600 lbs. of pure *Gadag No. 1* seed were sown over an area of 1,12,944 acres, against

12,95,700 lbs. of seed sown over an area of 92,539 acres last year. The natural spread of this variety is estimated at 35,000 acres, making a total of 1,48,000 acres. 45,91,860 lbs. of *Jayawant* seed and 13,46,400 lbs. of *Gadag No. 1* seed have been purchased so far for distribution in the 1939-40 season.

The cultivators' produce was pooled and sold by auction at different centres and sub-centres. In all 29,108 *docras** of *Jayawant* and 31,895 *docras* of *Gadag No. 1* were sold during the year, against 16,468 *docras* of *Jayawant* and 26,975 *docras* of *Gadag No. 1*, last year. The extra profit realised by cultivators from auction sales is estimated at Rs. 84,000 for *Jayawant* and Rs. 80,000 for *Gadag No. 1*.

Scheme for maintenance of nucleus of pure seed of improved varieties of cotton.—In pursuance of the policy of the Committee to maintain a nucleus of seed of all approved varieties of cotton, a scheme for the maintenance of a nucleus of each of the following seven varieties of cotton was sanctioned in August 1937 at a total cost of Rs. 2,660 per annum (*i.e.*, Rs. 380 for each variety) for a period of five years :—

(1) *1027 A.L.F.*
(2) *B.D. 8.*
(3) *Jarila* (Bhadgaon).
(4) *Jarila* (Jalgaon).
(5) *Jayawant.*
(6) *Gadag No. 1.*
(7) *Banilla.*

The total area selfed and the quantity of seed produced of each variety during the year are given below :—

Name of variety.	Area selfed.		Amount of selfed seed produced. Lbs.	Remarks.
	Acres.	Gunthas.		
(1) *1027 A.L.F.*	2	35	326	More seed selfed to take full advantage of short period of boll formation.
(2) *B. D. 8*	1	0	321	179 lbs. of open fertilised seed also produced.
(3) *Jarila* (Bhadgaon) ..	1	20	320	
(4) *Jarila* (Jalgaon)	1	0	178	Low yield due to boll shedding.
(5) *Jayawant*	1	0	482	
(6) *Gadag No. 1*	1	0	325	
(7) *Banilla*	1	0	200	

* Weight variable, usually about 300/400 lbs.

3. Central Provinces and Berar.

Verum Seed Distribution and Marketing Scheme.—In November 1929, the Committee sanctioned, for a period of one year in the first instance, the Central Provinces Verum Seed Distribution and Extension Scheme. It started work in September 1930 and was extended annually up to the end of July 1934, when it was combined with a newly sanctioned scheme for the extension of long staple cottons in the Central Provinces. The combined scheme, known as " Scheme for Extension of Long Staple Cotton and Marketing of *Verum* cotton in the Central Provinces and Berar " was sanctioned for five years from June 1934. At the meeting of the Committee, held in July 1938, it was extended for a further period of three years, the title being changed to " Scheme for the Extension and Marketing of *V. 434* Cotton." The total grant so far sanctioned for the scheme amounts to Rs. 3,70,444.

During the year under report, the Agricultural Department distributed 4,231 *khandis** of pure seed of improved strains sufficient to cover about 1,12,853 acres, against 4,233 *khandis* for 87, 649 acres in 1937-38. 5,482 bales of pure cotton were disposed of at an average premium of Rs. 43-7-0 *on* Broach and Rs. 55-10-0 *on Oomras* against, 4,575 bales sold in the previous year at an average premium of Rs. 39-15-0 *on* Broach and Rs. 57-7-0 *on Oomras.*

Distribution and Marketing of Buri 107 cotton in Burhanpur Tehsil.—This scheme aims at introducing *buri 107*—a selection from acclimatised *Gossypium hirsutum*—in the 30,000 acres now under mixed local *buri* in the course of three years. The scheme was sanctioned by the Committee in July 1938, for a period of three years at a total estimated cost of Rs. 19,535, of which the Committee's share amounts to Rs. 15,300 on account of the cost of staff. The scheme came into operation in March 1939.

Maintenance of nucleus of pure seed of improved strains of cotton.—This scheme for the maintenance of nucleus of pure seed for each of the cotton strains, *V. 434*, Late *Verum*, *No. 438* and *buri 107*, was sanctioned by the Committee in July 1938 at a total cost of Rs. 7,000 spread over a period of five years from April 1939.

4. Sind.

Sind Seed Distribution and Extension Scheme.—This scheme was sanctioned in December 1930 for a period of three years and came into operation in April 1931. It was extended in August 1933 for five years from the 1st April 1934 and in November 1938, a further extension for two years was sanctioned. The total grant for the scheme amounts to Rs. 4,34,202. The main objects of the scheme are :—

(*a*) Varietal tests of improved strains—Sind-American cottons.

(*b*) Trials of high quality cottons—Egyptians and imported American cottons.

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* *1 Khandi*=784 lbs.

(c) Demonstration of cotton cultivation on non-cotton growing areas on new barrage lands.

(d) Seed multiplication, distribution and extension work.

(e) Propaganda, demonstration and advisory work in connection with the extension of improved varieties of cotton and better methods of cultivation.

(f) Assistance to cotton growers in marketing cotton.

The work during the year, both on the Right and Left Banks of the Indus, continued on the lines of the previous years. The work on the Right Bank is mainly concerned with the extension of cotton cultivation, while on the Left Bank attention is largely devoted to seed distribution and extension of improved varieties of cotton and the introduction of better methods of cultivation.

On the Left Bank, during the year under report, 5,48,500 acres were under improved varieties, representing 59.4% of the area under cotton in Sind, against 5,05,000 acres representing 52.3% of the area in the previous year. 15,052* *maunds* of Sind *N.R.*, 31,524 *maunds* of Sind *Sudhar* and 8,562 *maunds* of *4F-98* were distributed during the year, against 2,908 *maunds* of Sind *N.R.*, 11,569 *maunds* of Sind *Sudhar* and 13,980 *maunds* of *4F-98* distributed in the past year. 29,274 *maunds* of Sind *Sudhar* sufficient for 64,500 acres and about 3,751 *maunds* of Sind *N.R.* sufficient for 10,000 acres were distributed to registered growers for sowing in the 1939-40 season. In order to obtain a supply of pure seed, the Sind Government have established a ginning factory at Mirpurkhas where the produce of Government farms and a few selected growers is ginned. During the year, 10,200 *maunds* of *kapas* were ginned and sold under the supervision of the Agricultural Department. The cultivators realized as. 4 to as. 8 more per *maund* of *kapas* than the local rate by getting their produce ginned at the Government ginning factory and selling the lint and seed separately.

On the Right Bank, the quantity of improved seed distributed during 1938-39 was about 10,000 *maunds* of *4F-98*. Seed of Sind *Sudhar*, *Sea Island* and *Boss III* varieties was also obtained from the Left Bank for sowing. It is anticipated that about 8,000 *maunds* of *4F-98* will be available for sowing in the 1939-40 season. During the year under report, 1,54,900 *maunds* of *kapas* were produced and sold at a net rate of Rs. 5-8-0 per *maund*. It is reported that, owing to insufficient ginning and marketing facilities, cotton growers continue to suffer a loss of about as. 6 per *maund* of *kapas*, and that much *kapas* is being taken to Hyderabad (Sind) for mixing with inferior cotton. Such mixing can be prevented by the application of either the Cotton Ginning and Pressing Factories Act or the Cotton Transport Act to the Right Bank areas.

Scheme for maintenance of nucleus of pure seed of improved varieties of cotton in Sind.—In pursuance of the policy of the Committee for the maintenance

*1 maund = 82-2/7 lbs.

of a nucleus of seed of all varieties of cotton, the spread of which has been approved by it, a nucleus scheme for the following five varieties of cotton was sanctioned in August 1937 for a period of five years at an estimated cost of Rs. 2,500 per annum :—

1. Sind *N.R.*
2. Sind *Sudhar.*
3. 4*F*-98.
4. *Sea Island* 2-4.
5. *Boss III*-16.

The scheme started in April 1938 and during the year under review, the total area selfed and the amount of seed produced of all the 5 varieties were 5 acres and 793 lbs., respectively.

Financing of Seed Distribution.—The Committee at its meeting held in January 1938, sanctioned a scheme for the financing of seed distribution in Sind for a period of three years, at an estimated annual cost of Rs. 45,000 and Rs. 15,250 to be borne by the Committee and the Sind Government respectively, subject to the condition that the scheme would not be put into operation until the rules under the Cotton Ginning and Pressing Factories (Bombay Amendment) Act have been brought into force. As the condition imposed has not been given effect to, the scheme has not yet been put into operation.

5. Hyderabad State.

A *Seed Distribution Scheme* for the Hyderabad State was sanctioned in November 1929 for three years in the first instance and came into operation in March 1930. It was extended in February 1933 for three years and again in January 1936 for another six months. In August 1936, it was extended for a further period of 4½ years from the 1st September 1936. The total grant sanctioned by the Committee for the scheme amounts to Rs. 61,265-8-0. The object of the scheme is to introduce improved strains of cotton in the Raichur District and to market the crop under favourable conditions so as to secure a better premium for the cultivator. During the first two years of the scheme, seeds of *Dharwar No. 1* and *Gadag No. 1* were distributed, but as a result of the experiments conducted by the Hyderabad and Bombay Agricultural Departments, the distribution of *Dharwar No. 1* seed was discontinued in favour of *Jayawant* which was found more suitable. During the year under report, 2,54,918 lbs. of *Jayawant* seed were sown over an area of 21,706 acres and 2,520 lbs. of *Gadag No. 1* over an area of 300 acres, against 2,53,004 lbs. of *Jayawant* over 20,032 acres and 10,941 lbs. of *Gadag No. 1* over 1,060 acres in 1937-38. The natural spread under *Jayawant* was 30,000 acres. The area under *Gadag No. 1* is reported to be declining in favour of *Jayawant*. The estimated outturn of *Jayawant* was 53 lbs. of lint per acre against 23 lbs. last year. *Gadag No. 1* yielded 45 lbs. of lint per acre against 18 lbs. last year. To procure pure seed of improved varieties for distribution in the ensuing season, the Agricultural Department earmarked an area of 5,000 acres in

Kopbal, Yelburga and Gangawati *talukas*, which was sown, rogued and supervised by the departmental staff. Three acres of land at Mohammad-Nagar were also sown under irrigation with 1st generation seed of *Jayawant* supplied from the Raichur Farm. A further 20 acres were sown under irrigation with *Jayawant* seed obtained from Raichur and Mohammad-Nagar. The above arrangements are expected to give about 4,20,000 lbs. of *Jayawant* seed, sufficient for sowing 30,000 acres in 1939-40.

The Kopbal Co-operative Cotton Sale Society, which was started in 1932, continued to co-operate with the Agricultural Department in the production and sale of pure seed and the holding of auction sales. During the year, 750 *docras* of *Jayawant kapas* were sold by auction at a premium of Rs. 30 *on* Broach. At another auction 329 *docras* of *Jayawant kapas* were sold at a premium of about Rs. 20 *on* Broach.

6. Baroda State.

Baroda (Navsari Seed Storage) Scheme.—This scheme, which is concerned with the spread of *1027 A.L.F.* in the Navsari district of the Baroda State, was sanctioned in February 1933 for a period of five years, subject to the condition that the Baroda Government would arrange a seed multiplication area of 1,000 to 2,000 acres in that district. Work on the scheme started in April 1934. At the meeting of the Committee in July 1938, the scheme was extended for a further period of five years from 1st April 1939. The total grant sanctioned by the Committee towards the scheme amounts to Rs. 55,488. During the year under report, 20,406 lbs. of seed raised from pedigreed seed were issued to ' A ' class growers for sowing over an area of 1,200 acres and 1,56,962 lbs. to ' B ' class growers for sowing over an area of 7,000 acres. The produce of the improved seed was marketed through the marketing office at Surat. 1,787 bales of lint were sold at a premium varying from Rs. 1-10-0 to Rs. 10 per *khandy*, against about 559 bales sold last year at premiums ranging from Rs. 3 to Rs. 11 per *khandy*.

B.D. 8 Cotton Scheme.—This scheme, which has for its object the extension of *B.D. 8* cotton in the Baroda District, was sanctioned in July 1938 for a period of five years at an estimated cost of Rs. 34,900 of which a sum of Rs. 17,300 was to be borne by the Committee. During the period the scheme has been in operation, 5,130 lbs. of ' A ' grade seed, 18,760 lbs. of ' B ' grade seed and 57,800 lbs. of ' C ' grade seed have been distributed for sowing over an area of about 8,000 acres.

Since 1929, the undermentioned Seed Distribution and Extension Schemes, financed by the Committee, have closed down after completion of their sanctioned period or for other reasons. The work done under these schemes has been reviewed in the previous reports :—

Madras Province :—

(1) *H. 1.*

(2) Madras (Tiruppur) Seed Extension Scheme.

Bombay Province :—

(3) Hubli.
(4) Gadag.
(5) Gadag Supplementary.
(6) Athani.
(7) Khandesh (*banilla*).

United Provinces :—

(8) *C. 402.*

Punjab :—

(9) Lyallpur (Ginnery).

CHAPTER IV.

PROGRESS IN THE INTRODUCTION OF IMPROVED VARIETIES OF COTTON.

The work of crop improvement is necessarily slow in the production of results, because of the many years involved in the selection, fixation, testing and introduction of suitable or superior new types. Breeding work must extend through many generations. Varieties must be compared in a number of different kinds of seasons for correct evaluation. Several seasons' building-up and testing are thus required before the decision to introduce a new or improved type of cotton into general cultivation can be taken. By the joint efforts of the Indian Central Cotton Committee and the Departments of Agriculture, considerable amount of work in this connection has, however, already been accomplished, and it is proposed in this chapter to give a brief review of the progress made in the introduction of improved varieties of cotton.

1. MADRAS.

The total area under cotton in Madras during 1938-39 was 1,951,800 acres, the *Tinnevellies* (including *karunganni* grown in Coimbatore) occupying 575,200 acres, *Cambodia* 339,900 acres, *Salems* (excluding *karungannies* in Coimbatore) 23,400 acres, *Cocanadas* 123,300 acres and the *Northerns* and *Westerns* 890,000 acres. So far as it has been possible to estimate, the area under improved varieties was roughly as follows :—

Tinnevellies C.7, *K. 1* and *A. 10*	162,267	acres.
Cambodia Co. 2 and *920*	216,024	,,
Northerns N. 14 and *Westerns H. 1*	232,925	,,
Total	621,476	,,

Of the six commercial varieties grown in Madras, very little improvement has so far been effected in *Cocanadas* and *Salems* (excluding *karungannies* grown in Coimbatore). Recently, however, a scheme for the improvement of *Cocanadas* cottons has been sanctioned by the Committee and it is hoped that suitable improved types will be developed in the course of a few years.

The *Westerns* and *Northerns* form the biggest group as regards total area. The acreage and yields, however, fluctuate considerably, as the regions in which these cottons are grown are liable to suffer from frequent droughts

and famines. The most important improved strain evolved in the *Westerns* and *Northerns* cottons are *H. 1* and *N. 14*, respectively. *H.1* (*Gossypium herbaceum var frutescens*) which is a selection from another strain, *H. 25*, has a ginning percentage of 31, against 27 of the commercial *Westerns* and is grown on the black soils of Bellary district and in parts of Anantapur district. *N. 14* (*Gossypium arboreum var neglectum indica H. & G.*) which was evolved by single plant selection in the *Northerns* cottons is considered to be one of the finest indigeneous cotton of India. It has a staple length of 1″ and a ginning percentage of about 24. The bolls, however, open badly and therefore, it is somewhat difficult to pick. It thrives best on mixed soils in years of good rainfall.

Cambodia is the next important cotton. The total output of *Cambodia* has risen considerably, as a result of the increase that has taken place in the area under improved strains. The strain *Co. 1* mentioned in the publication entitled " Cotton improvement in India " issued by the Committee in 1931, has now been superseded by *Co. 2*, which is a hardier and better yielding strain. The rapid spread of *Co. 2* is to be attributed to the subsidy granted by the Committee to the Tirupur Co-operative Society for running seed farms and to the springing up of a number of mills in and around Coimbatore, which have created a large local demand for this cotton. *Co. 2*,—a selection from *Cambodia*—is a robust, jassid resistant, high yielding type and possesses large bolls which open widely. It has a lint length of about 1″ and a ginning percentage of 33 to 35 and is estimated to benefit the grower to the extent of Rs. 15 per acre. It now occupies more than 200,000 acres, mostly concentrated in Coimbatore, Salem and Madura districts. Recently, two more strains, *viz.*, *920* and *1267*, have been introduced and are gradually replacing *Co. 2* in Coimbatore and Srivilliputhur *taluks* on account of their sturdier growth and less susceptibility to shedding. Two more strains which deserve mention here are × *4383* and × *3915*, both of which are earlier and more prolific that either *Co. 2* or *920*, and are at the same time superior in respect of quality. Strain × *4382* is a derivative from a cross between *Co. 2* × *A. 12* (a South African cotton) and was evolved at the Cotton Breeding Station, Coimbatore, in 1936 by hybridisation. It is earlier than *Co. 2* by about three to four weeks, but although better in staple and capable of spinning 40s to 42s, its ginning percentage is only 31 against 33 to 35 of *Co. 2*. It is, however, valued at Rs. 20 *on* best *Cambodia*, and in the Ramnad district, where it was tried during the past three seasons, it gave 50 to 80% higher yield than *Co. 2*. This year it has been grown on a seed farm of 100 acres for the first time. Similarly, strain × *3915* has been obtained by hybridising *Co. 2* with *U. 4* (a South African cotton). It is as early as × *4383*, but is finer in staple and higher in ginning outturn (36 to 39%) than the latter and is capable of spinning 42 highest standard warp counts.

The *Tinnevellies* include all *karunganni* cottons grown in the province. As is well known, the commercial ' Tinnies ' is a mixture of two cottons—*karunganni* and *uppam*. The former is distinctly superior to the latter in general yield and quality, as well as spinning performance. As a consequence,

it brings in more money to the grower. The area under improved *karunganni* has increased (especially in Coimbatore and Tinnevelly districts) from 83,273 acres in 1930-31 to over 200,000 in 1938-39. The improved strains evolved under this cotton are *C. 7*, *A. 10* and *K. 1*. The first two have been evolved by selection in *karunganni* at Koilpatti Agricultural Research Station. *C. 7* is suitable for tracts south and east of Koilpatti, while *A. 10* flourishes best in the regions north of Koilpatti. Both are alike as regards lint length and ginning percentage, but in spinning performance *C. 7* is superior. *K. 1*, on the other hand, was evolved by re-selection in *C. 7* in a year of drought. It is earlier and hardier than the latter, and thus does better than either *C. 7* and *A.* 10 under adverse conditions. It is not affected by February rains, and has been found to give a higher yield than the local cottons. Owing to its earliness, drought resistance and non-shedding qualities, it is gaining ground and is expected soon to replace *C. 7* and *A. 10*.

2. Bombay.

The total area under cotton in the Bombay Province, including Indian States, during the year 1938-39 was 5,751,139 acres as shown below :—

	Acres.
Total British districts	3,626,632
Total Indian States	2,124,507
Total ..	5,751,139

The area under improved strains is shown below :—

Name of cotton.	Area (Acres) in 1938-39.	Where concentrated.
1. *1027 A. L. F.* ..	2,12,000	Tract lying south of Narmada river.
2. *B. D. 8*	18,800	Broach District.
3. *Jarila*	9,836	Khandesh.
4 *Jayawant*	3,24,197	Hubli, Navalgund, Haveri (Dharwar District.) Bailhongal, Athani (Belgaum District). Bagalkot, Bijapur (Bijapur District.)
	2,156	Tasgaon in Satara District.
5. *Gadag No. 1* ..	1,12,944	Gadag and Ron (Dharwar District.)
6. *Banilla*	7,745	Deccan Canals, Ahmednagar and Sholapur Districts.
Total ..	6,87,678	

(1) *1027 A. L. F.* is a cross between *Kumpta* and *goghari* cottons. It has a staple length of 15/16″ and a ginning percentage of 33 to 36 and is capable of spinning up to 38 counts. It fetches a premium of Rs. 10 to Rs. 15 per *khandi* on local rate.

(2) *B. D. 8* was originally selected from a cotton variety known as "Purified Broach Deshi" grown on the Broach Farm. It has a staple length of 0.90″, ginning percentage of 33.7 and is capable of spinning 37 counts.

(3) *Jarilla cotton.*—As a result of breeding work on *Verum* cottons at the Jalgaon Farm, a new *Verum* selection now known as *jarila* cotton has been evolved. It is wilt resistant and possesses fine staple (13/16″), capable of spinning 24 counts under mill conditions. With a ginning percentage of 33 to 35, it obtains a premium of Rs. 30 to Rs. 40 per *khandi* over the local cotton.

(4) *Jayawant* is a cross between *Dharwar I* and *Dharwar II*—two selections from local-*Kumpta* cotton. It gins high and is capable of spinning up to 40 counts.

(5) *Gadag No.* 1 is a selection from the local *Dharwar-American* cotton.

(6) *Banilla* is a cross between *bani* (a long staple, fine, silky but low ginning cotton) and *comilla* (a short staple but very high ginning cotton).

3. Punjab.

The total area under cotton in the British Districts of the Punjab during *kharif* 1938 was 2,902,300 acres. Of this 1,554,700 acres were sown under Punjab-American varieties and 1,347,600 acres under *desi* cottons.

So far, as it has been possible to estimate, the area under improved varieties was roughly as follows :—

(*a*) *Punjab-American varieties.*

	Acres.
4F	1,061,000
L. S. S.	200,000
289F/43	125,000
289F including *K. T.* types	160,000
Other types	8,000
Total	1,554,000

(*b*) *Improved Desi cottons.*

Mollisonis	755,000
Rosea Bhatla	40,000
Other improved types	160,000
Total	955,000

4F was first distributed by the Department of Agriculture in 1914. The fibre length of this variety is $\frac{7}{8}$″ and spins 20 to 25 counts. The ginning outturn is about 31%. A few years ago it was the most important variety of American cotton in the province, but now it is being replaced by different improved

strains suited to different tracts. The seed of this cotton is stocked in all the Agricultural Department's seed selling agencies, and the *zamindars* are advised to buy all their requirements from these agencies.

L. S. S. is a selection from *4F* and is chiefly grown in Lyallpur, Sheikhupura and parts of Sargodha districts. Its fibre length is 1" and it spins 40 counts. The ginning outturn is about 31%. When marketed in bulk, *L. S.S.* fetches a better price than *4F*. It is a high yielding cotton, but matures late, and, therefore, requires one or two irrigations in October.

289F/43 is a long stapled, high yielding and early maturing variety of Punjab-American cotton. It is resistant to the attack of jassids. The fibre length is 1-1/32" and it spins 40 counts. The ginning outturn is 29%. The most noteworthy features of this strain are its tolerance to the shortage of water and its early maturing habit. In fact, it matures and gives the first picking along with *desi* cottons and, therefore, does not suffer from early frost. It is most popular in lower Bari Doab Canal Colony (except Khanewal Division), Nili Bar and inundation tracts. It has also proved successful in Lower Chenab Canal Colony. It responds to late sowing better than other varieties, especially in south-western parts of the province, and if for any reason late sowings up to the end of June have to be done, this variety should be preferred.

Mollisoni 39 is a tall growing variety and has a lint length of $\frac{5}{8}$", and a ginning percentage of 35 to 36. Its yield is the highest amongst all the *desi* varieties and it is recommended that all *zamindars* who grow *desi* cotton in the Canal Colonies should sow this strain.

12-sanguineum is a late maturing, very high yielding strain of Multani cotton and is reported to have done very well in Rawalpindi and adjoining districts as a rain-fed crop. Its ginning percentage is 33, but the lint is rather fine.

M. 60-A-2 is another improved strain which was selected and developed at the Hansi Agricultural Farm and is a popular cotton in the south-eastern Punjab. On account of its high yield, it is rapidly replacing the local mixtures. As its ginning outturn is about 42%, it also commands a premium over unselected local *kapas*.

4. Central Provinces and Berar.

The total area under cotton in the Central Provinces and Berar during 1938-39 was 3,741,529 acres. The area under improved strains during the same period is shown below :—

	Acres.
V. 434	62,032
Verum 262	35,435
Late *Verum*	10,105
Improved *buri*	3,202
No. 438	1,661
Total ..	112,435

V. 434 (*Gossypium arboreum variety neglectum forma bengalensis H and G*) is a pure line selection from *Gossypium neglectum Verum*, and was evolved in 1932. Its chief merit lies in its adaptability to varying conditions of soil and climate. It possesses, in addition to wilt resistance qualities, drought resistance, prolific flowering capacity, quickness in forming buds and setting fruit, comparative freedom from shedding and excellent lint characters and good ginning percentage. Its staple length is about 1″ and it has been adjudged suitable for spinning 30s to 37s highest standard warp counts. The ginning percentage is 31. This is the best all round strain available at present. It is grown chiefly in the districts of Akola, Amraoti, Buldana, Yeotmal, Nimar, Wardha and Nagpur. The Agricultural Department has now decided to expand its cultivation in the *taluks* of Chikhli, Mehkar, Basim, Pusad, Ellichpur, Khandwa and Harsud.

Verum 262 (*Gossypium arboreum variety neglectum forma bengalensis H and G*) is also a pure line selection from *Gossypium neglectum verum.* It was originally evolved to replace *roseum* which is susceptible to wilt. Being wilt resistant, *Verum 262* fulfilled the immediate requirements of the time and was a considerable improvement over *roseum* owing to the superior quality of its lint. With a ginning percentage of 32 and capacity to spin 21s to 26s highest standard warp counts, it gave lint yield which on wilted land was unquestionably higher than that of *roseum.* Even on non-wilted land, the premium it obtained more than compensated for its slightly lower yield and ginning percentage as compared with *jari.* Experience, however, proved this cotton to be susceptible to variations in climatic conditions which rendered estimation of its cropping power a difficult matter, owing to wide fluctuations in yield from year to year. It was accordingly decided to replace it by the newly evolved strain—*V.434.*

Late *Verum* (*Gossypium arboreum variety neglectum forma bengalensis H and G*) is a wilt resistant, pure line selection from *Verum.* It has proved suitable for growing in areas where monsoon lasts till rather late in the season. The staple is 1″ long and it is capable of spinning 33s highest standard warp counts; but owing to the all round suitability of *V. 434* and the advanatge of having as few types as possible under cultivation in adjacent areas, it is recommended that, except in areas where Late *Verum* shows a distinct advantage over *V. 434*, the latter type is the one that should be grown. It is at present grown in parts of Nagpur, Wardha, Chanda, Yeotmal, Buldana and Nimar districts.

Improved buri 107 (*Gossypium hirsutum*) is a selection from acclimatised *Upland* American cotton, and has been found to be particularly suitable for areas in and around Burhanpur *tahsil* in the Nimar District. A seed distribution scheme for this cotton has recently been sanctioned by the Committee, the object being to replace the local mixed *buri* by the improved type, *buri 107*, on an area of some 30,000 acres during the course of the next three years. It is capable of spinning up to 40s highest standard warp counts, and has a ginning percentage of 27 to 28.

No. 438 is another selection from *Verum*. It has been found to be particularly suitable for lighter descriptions of soils in the Nimar and Buldana districts. It has a soft long lint, capable of spinning up to 34s highest standard warp counts.

5. Sind.

The rapid expansion of cotton cultivation in Sind, as will be seen from the following statement, is attributable to perennial irrigation under the Barrage Canals.

Year.	Total area in acres both for *deshi* and American.
Pre-Barrage decade (average)	3,20,880
1932-33	3,42,860
1933-34	5,20,986
1934-35	6,22,710
1935-36	7,67,766
1936-37	8,93,976
1937-38	9,70,174
1938-39	9,23,013

It will be seen that the total acreage under cotton in Sind (both *deshi* and American) in 1937-38 increased to three times the average annual acreage during the decade preceding the opening of the Lloyd Barrage and Canal System. A more striking development is the increase in area under Sind American cotton which has risen from 8 to 65%. The area under American cotton in 1937-38 averaged 6,27,394 acres compared with 25,640 acres during the pre-Barrage decade, *i.e.*, 1922-32. The chief improved varieties of Sind American cotton are Sind *Sudhar* for the Left Bank and *4F-98* for the right Bank. These two strains have gradually replaced the varieties which were first introduced. The total area under improved varieties during 1938-39 was 4,98,500 acres as shown below :—

	Acres.
Sind *Sudhar*	2,25,000
4F-98	48,500
Sind *deshi*	2,25,000
Total ..	4,98,500

Sind *Sudhar* has full 1" staple and spins about 40 counts. It is a high yielding cotton with a ginning percentage of about 29 to 30 in normal years. It is resistant to red leaf blight and jassid attack and can withstand seasonal variations of climate better than the ordinary *289F* and other similar cottons. It is now grown all over the Indus Left Bank. The good premium obtained by this cotton during the last five years has resulted in a considerable increase in area under it.

4F-98, which has been evolved from the *4F* ordinary cotton, has a staple length of 7/8" to 15/16" and is capable of spinning 34 counts. Its ginning outturn is 33% and it has been found to be the most suitable type for cultivation in the new cotton growing tracts on the right bank of the river Indus.

The improved Sind *deshi* cotton, known as Sind *N.E.*, is the standard *deshi* cotton of Sind, occupying an area of about 2,25,000 acres. Its cultivation is confined to Nawabshah and upper part of Hyderabad District. Its yield is about 16 to 20% higher than the ordinary Sind *deshi*. It possesses the further advantage of being a good ginner, the ginning outturn being 4 to 5% higher than that of ordinary *deshi*.

CHAPTER V.

COTTON STATISTICS.

India occupies a prominent place among countries producing cotton of various staples and standards of cleanliness from 1-1/32" in staple to very nearly the shortest staple produced anywhere. The importance of reliable statistical information relating to cotton cannot be too strongly emphasised. It is quite necessary, for instance, for the grower, the trade and the industry alike to have a more or less accurate idea of the quantities of cotton of different staples and qualities produced in the country, the quantities exported or used by Indian mills, extra-factory consumption and stocks of Indian cotton held in the country. Considerable time and attention are, therefore, devoted to collecting, analysing and disseminating all useful information in this connection. Bulletins, leaflets and press notes are issued from time to time giving such data as it has been possible to collect and compile. A brief review of the work done during the year under this head is given below.

1. Changes in Yield and Character of Indian Cotton Crop.

The total area under cotton in India during the year under review was 23,553,000 acres. Of this, for India as a whole, the ascertained area under improved strains of cotton was 5,663,000 acres or 24 per cent of the total. With the introduction and extension of improved varieties of cotton, the character of the Indian cotton crop has gradually been undergoing a change. This will be apparent from the following table :—

Change in the Character of the Indian Cotton Crop.

Indian cotton crop classified according to varieties and length of staple.

(Based chiefly on the "Estimates of Area and Yield of Principal Crops in India" and "Cotton Forecasts" published by the Department of Commercial Intelligence and Statistics in India.)

(Excludes Burma.) Quantities are in thousand bales* of 400 lbs. each.

Descriptions of cotton.	Average of 1927-28 to 1931-32.	Average of 1932-33 to 1936-37.	1937-38.	1938-39.	Percentage increase (+) or decrease (-) of Col. 5 over Col. 2.
1	2	3	4	5	6
Short staple—Below 7/8"					
1. *Bengals*	907	1,244	1,347	1,035	
2. *Oomras*	1,906	1,351	1,395	1,152	
3. Central India	306	244	217	252	
4. Broach (part)	62	132	262	223	
5. *Dholleras*	586	594	493	337	
6. *Kumpta & Upland* (part)	(a)	(a)	17	23	
Carried over ..	3,767	3,565	3,731	3,022	

* Statistical bales containing 400 lbs. of cleaned (lint) cotton.

(a) Included under item No. 19, separate figures not being available.

CHANGE IN THE CHARACTER OF THE INDIAN COTTON CROP—(*contd.*)

Descriptions of cotton.	Average of 1927-28 to 1931-32.	Average of 1932-33 to 1936-37.	1937-38.	1938-39.	Percentage increase (+) or decrease (−) of Col. 5 over Col. 2.
1	2	3	4	5	6
Brought forward ..	3,767	3,565	3,731	3,022	
Short staple—Below 7/8″—(contd.)					
7. Bijapur & Bagalkot Jowari 8. *Westerns* (part) ..	(*b*)	(*b*)	147	155	
9. Warangal & *Cocanadas*	39	26	24	21	
10. *Chinnapathi* .. .. 11. *Salems* .. .. .. 12. *Comillas*	73	74	88	52	
Total—Short staple: Quantity ..	3,879	3,665	3,990	3,250	—19
Total—Short staple: % on 'Total—All Staples'	75	69	69	63	
Medium and long staple— 7/8″ *and above.*					
13. *Americans*†—Punjab and Sind—(Staple 1″ and above)	(*c*)	22‡	178	227	
14. *Americans*—Punjab and Sind—(Staple below 1″)	238	620	773	804	
15. Central Provinces and Berar *Verum*	(*d*)	25	25	22	
16. Hyderabad *gaorani* ..	140	133	142	129	
17. Broach (part) .. 18. Surti	188	162	134	183	
19. *Kumpta & Upland* (part).	260	177	138	185	
20. *Westerns* (part) .. 21. White & Red *Northerns*	229	199	32	69	
22. *Tinnevellies* (including *Karungannies*) ..	146	136	151	132	
23. *Cambodias*	126	176	216	119	
Total—Medium and long staple: Quantity ..	1,327	1,650	1,789	1,870	+40
Total—Medium and long staple: % on 'Total—All Staples'	25	31	31	37	
Total—All Staples ..	5,206	5,315	5,779	5,120	—2

† Includes "Punjab-American *289F*," "Sind-American *289F* (or Sind *Sudhar*)" and "Punjab-American *289-F/43*."

‡ Average for "Punjab-American *289F*" only. Figures for other varieties of staple 1″ and above, being not available for the complete five-year period, have been included under item (14).

(*b*) Included under item No. 20, separate figures not being available.
(*c*) ,, ,, No. 14 ,, ,, ,, ,,
(*d*) ,, ,, No. 2 ,, ,, ,, ,,

It will be seen that the proportion of cotton of staple length 7/8" and above to the total production increased from 26% in the quinquennium 1927-32 to 31% in the quinquennium 1932-37 ; the proportion in 1938-39 was 37%.

That there has been a noticeable improvement also in the yield per acre is shown in the following table in which two sets of figures, one based on the official crop forecasts and the other on the figures of actual crop accounted for by mill consumption, exports and extra-factory consumption are given :—

CHANGES IN YIELDS OF COTTON IN INDIA.

(1st September—31st August.) Year.	Area. (Thousand acres.)	Production. Government estimates. (Thousand bales of 400 lbs. each.)	Yield per acre. (lbs.) Co. 3. / Col. 2.	Production of cotton of staple length 7/8" and above. (Government estimates.) Actual. (Thousand bales of 400 lbs. each.)	Per cent on total.	Approximate (Commercial) crop. (Thousand bales of 400 lbs. each.)	Yield per acre. Calculated from approximate (Commercial) crop. (lbs.) Col. 7 / Col. 2.
1	2	3	4	5	6	7	8
Average 1922-27 ..	24,723	5,449	87	1,622	30	*5,954	96
„ 1927-32 ..	24,738	5,206	84	1,327	25	*5,851	95
„ 1932-37 ..	23,912	5,315	89	1,650	31	*6,447	108
1937-38 ..	25,746	5,779	90	1,789	31	†6,370	99
1938-39 ..	23,553	5,120	87	1,870	37	†6,148	104

From the second set of figures given in column 8, it will be seen that the average yield per acre rose from 96 lbs. in the quinquennium 1922-27 to 108 lbs. in the quinquennium 1932-37.

2. Cotton Crop Estimates.

The area under cotton in India decreased to 23,553,000 acres in the year under report from 25,746,000 acres in the previous year. The reduction was recorded mainly in the Provinces of Madras, Bombay, the Punjab and the Central Provinces and Berar ; the drop in acreage in the Madras province was due chiefly to unfavourable seasonal conditions. The total estimated outturn for 1938-39 was 5,120,000 bales against 5,779,000 bales in 1937-38, the average yield per acre being 87 and 90 lbs., respectively. Unfavourable weather conditions during the growing period were responsible for the reduced yields obtained in the cotton tracts of Madras, Sind, the Central Provinces and Berar and the

* Calculated from mill consumption (*a*) + exports (*b*) + extra-factory consumption (*c*). Variation in stocks has not, however, been taken into account.

(*a*) Mill consumption in Burma included up to 31st March 1937.

(*b*) Includes exports from Burma up to 1934-35.

(*c*) The new figure for extra-factory consumption, *viz.*, 450,000 bales for the whole of India, based on enquiries conducted by the Committee, in selected areas, has been used throughout.

† Best estimate of the crop as arrived at by the Indian Central Cotton Committee in connection with the annual post-mortem examination of all-India cotton forecasts.

United Provinces. The quantity of cotton pressed, including loose cotton consumed in mills in India during the year, and the extra-factory consumption of cotton, taken at 450,000 bales, amounted to 6,019,000 bales of 400 lbs. each.

By arrangement with the Director General of Commercial Intelligence and Statistics, Calcutta, the estimates of the cotton crop were received by wire and released in Bombay at a time previously fixed, so as to synchronise with the time of their release in Calcutta.

3. Revised Trade Classification of Indian Cottons.

As far back as 1933, the question of revising the classification of cotton areas of India on the basis of the varieties of cotton grown in them was taken up. In consultation with the various trade bodies concerned, provincial and State Directors of Agriculture and the Director General of Commercial Intelligence and Statistics, a scheme was devised for delimiting the areas under each trade description of cotton. The revised trade classification (Appendix IV), as finally approved by the Committee, was accepted by the Government of India and brought into force with effect from the first cotton forecast of 1939-40.

A varietal cotton map of India on the basis of the revised classification has been published by the Director General of Commercial Intelligence and Statistics, Calcutta. Copies are stocked at the Map Sales Office, Calcutta.

4. Improvement of Cotton Forecasts.

The Bombay Cotton Forecast Improvement Scheme, sanctioned by the Committee in 1934 for a period of five and a half years, at an estimated cost of Rs. 31,273, had for its object the improvement of the cotton forecasts of the Bombay Province (including Indian States) and Sind. According to the final report on this scheme, the chief sources of discrepancy in the area figures are due to (1) non-utilisation of results of crop inspection as they become available, (2) incompleteness of information relating to *talukdari* villages in North Gujerat and *bhayat* and other villages in States, (3) incorrect estimates of area under cotton sown mixed with other crops and (4) confusion between *bighas* and acres in the area figures reported by some States. In many cases, these defects have been rectified and in others suggestions have been made for ensuring greater accuracy. As regards anna valuation, it is observed that the chief defects are due to (1) difference in the number of annas taken to represent a normal crop, (2) confusion in understanding the definition of a normal crop and (3) indifferent estimation when question of land revenue is not involved. Steps have been taken to remedy the defects due to (1), while suggestions have been made with a view to minimising the error arising from the other items. With regard to the standard yield figures, the effect of the revision reported last year as a result of the work done under the scheme will be watched. As the report is of general interest, it has been decided to publish it. At the same time, attention of provincial and State forecasting authorities will be drawn to the recommendations contained in it.

A statistical examination of the results of crop-cutting experiments and other available data relating to the Punjab was completed during the year with a view to fixing the standard yield of cotton for each district and each kind of cotton (*desi*, American, irrigated and unirrigated). The new district standard yield figures thus arrived at are considerably higher than the old ones and the provincal standard yields for *desi* and American have accordingly been raised from 123 and 130 lbs. to 190 and 192 lbs., respectively. It is hoped that the adoption of the revised figures from the 1938-39 season will minimise the underestimation observed in the Punjab cotton forecasts during the past seasons.

The adoption of the tentative estimate of 450,000 bales per annum for the extra-factory consumption of cotton for the whole of India was reported last year. In this connection, it was felt that the figure of 233,000 bales taken for the Punjab and included in the all-India estimate was probably on the high side owing to the fact that the figure of *per capita* consumption of the investigated villages was applied to rural (village) as well as to urban (town) population and it was accordingly decided to undertake a separate investigation to ascertain the consumption for domestic purposes of cotton in towns in the Punjab. A small grant for the purpose was sanctioned by the Committee and the investigation is in progress.

The all-India cotton forecasts of each season are subjected to a *post-mortem* examination by the Cotton Forecast Improvement Sub-Committee of the Indian Central Cotton Committee at the close of the season with a view to detecting sources of errors and suggesting remedial measures. During the year under report, as a result of the examination of the all-India cotton forecasts of 1937-38 season, the attention of some of the Punjab States was drawn to the observed discrepancy between the figures of cotton pressed and the crop estimated in the forecasts. In view of the underestimation in the Sind cotton forecasts, which was ascribed mainly to incorrect estimates of anna valuation, the application of a correction factor to the anna valuation figures reported for the forecast was recommended for trial.

5. Collection of Statistics of Cotton Imported into Bombay by Road.

Arrivals of cotton by road into Bombay have for some time past been reported to be heavy and, in order to complete the statistics of cotton imported into Bombay, it was considered desirable to ascertain with accuracy the extent of these arrivals. As a result of representations made by the Committee and the East India Cotton Association and the Bombay Chamber of Commerce, which were also interested in this matter, it is understood that the Government of Bombay intend to undertake the necessary legislation to enable the statistics in question to be collected through the agency of the Bombay Port Trust. The expenditure on this account will be borne by the Committee, the East India Cotton Association, the Bombay Chamber of Commerce and certain other interested parties.

6. Staple Length of the Indian Cotton Crop.

A report on the estimated production of cotton according to staple length for 1938-39 season was issued in May ; the trade estimates of the crop were also presented in this report.

7. Report on the Accuracy of the All-India Cotton Forecasts.

The third issue of this Report pertaining to the season 1937-38 was published in July.

8. Statistics of Cotton Pressed.

Under the provisions of the Cotton Ginning and Pressing Factories Act, 1925, every cotton pressing factory in British India is required to submit to the prescribed authority weekly returns of the number of bales pressed in it. Indian States having pressing factories have also co-operated in enforcing the submission of similar returns by factories situated within their limits. The all-India figures of cotton pressed are published weekly in the Indian Trade Journal. In addition to the figures in running bales, their equivalents in statistical bales of 400 lbs. net are compiled by the Director General of Commercial Intelligence and Statistics and published monthly in the same Journal.

The Committee expressed its concurrence with the suggestion of the East India Cotton Association that the statistics of cotton pressed should be compiled on the basis of the recognised trade descriptions as adopted in the revised trade classification of Indian cottons. As this involved an amendment of the Cotton Ginning and Pressing Factories Act and the Rules thereunder, the Government of India were addressed in the matter.

During the season 1938-39, 3,658,702 bales of cotton were pressed in British India and 1,561,865 bales in Indian States, making a total of 5,220,567 bales for all-India; the corresponding figures for 1937-38 were 3,915,976, 1,646,424 and 5,562,400 bales, respectively.

9. Unpressed (Loose) Cotton Statistics.

The statistics of cotton pressed do not account for the whole of the Indian cotton crop, as, apart from the quantity utilised for extra-factory consumption, chiefly in the form of *kapas*, mills situated in cotton growing areas often use considerable quantities of ginned unpressed cotton. Prior to 1936-37 the relevant statistics relating to unpressed cotton were compiled on a voluntary basis but from 1936-37, they are being collected under statute by an amendment of the form of return submitted by mills under the Indian Cotton Cess Act, 1923. Similar information for Indian States is obtained on a voluntary basis through the courtesy of the Darbars concerned. During the year, 449,625 bales of unpressed cotton were consumed in mills in India against 430,040 bales during the preceding year. The relevant figures for 1926-27 to 1938-39 are given in Appendix V to this report.

10. Internal Consumption.

Figures of consumption of Indian cotton in mills in British India and Indian States for the years 1924-25 to 1938-39, based on the monthly statements issued by the Committee, are given in Appendix V. The total consumption of Indian cotton in mills in India during the season under report established a new record, being 3,121,000 bales of 400 lbs. each against 2,994,000 bales in 1937-38. The increase was recorded largely in the provinces of Madras and the United Provinces and to a less extent in the " Central Provinces and Berar " and " Punjab and Delhi." The figures in Appendix V show that consumption in the Madras province has steadily increased from 1933-34 with the result that the quantity consumed in 1938-39, *viz.*, 471,000 bales—a record for the province—exceeded twice the figure of a decade ago.

11. Exports.

The exports of Indian cotton during the season totalled 3,367,000 bales against 2,100,000 bales in 1937-38. The increase was due mainly to a marked recovery in China's demand for Indian cotton and to the larger off-take by Japan than in the previous year. The exports of Indian cotton to the United Kingdom amounted to 402,000 bales during the year, against 362,000 bales in the preceding year.

12. Stocks.

As in the past, mills, trade associations, market committees and other authorities gave every assistance in the collection of figures of stocks of cotton held in the country at the end of the season. Much ground, however, still remains to be covered before the statistics can be claimed to be complete. The information collected in respect of stocks held on the 31st August 1939 is contained in Appendix VI.

As the season adopted for the cotton crop of the Madras province is the year ending 31st January, figures of stocks held in the province on this date are collected annually in addition to the figures relating to the 31st August. The relevant figures for the 31st January 1939 together with comparative details for previous years are given in Appendix VI.

13. Demand for Various Types of Indian Cotton.

The statistics relating to the Indian mill and export demand for the various types of Indian cotton, compiled in the Secretary's office from information furnished on a voluntary basis are of considerable value not only to the trade and industry but also to those responsible for shaping and directing the cotton policy of the country. The statistics collected for the year 1938-39 are contained in Statistical Leaflets Nos. 3* and 4† (1938-39).

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*Appendix VIII. †Appendix VII.

14. Periodical Reviews of the State of Foreign Trade in Indian Cotton.

Through the courtesy of the Director General of Commercial Intelligence and Statistics, a clerk is employed in his office at the Committee's expense with the object of furnishing monthly reviews on the state of foreign trade in Indian cotton. These reviews, besides giving information on the developments in the cotton situation in general, also contain statistics relating to Indian cotton based on the British Indian trade accounts as well as on the trade accounts of the importing countries. The reviews are supplied to trade bodies represented on the Committee and to cotton spinning mills on request; they are also available to the public at a small charge.

15. Publications.

The undermentioned statistical publications were issued during the year under report :—

1. " A Guide to Indian Cottons "—in Hindi and Urdu.
2. *Statistical Bulletin No.* 7.—" Supply and distribution of the various types of Indian cotton during the season of 1936-37."
3. General Report on Nine enquiries into the Village or Extra-factory Consumption of cotton in India, 1933-36.
4. *Statistical Leaflet No.* 2.—Fifth Issue (1937-38), " Stocks of Indian raw cotton held in India by the mills and the trade on 31st August 1938."
5. *Statistical Leaflet No.* 3.—Fifth Issue (1937-38), " Receipts at mills in India of raw cotton classified by varieties—1937-38 season."
6. *Statistical Leaflet No.* 4.—Fifth Issue (1937-38), " Export by sea of Indian raw cotton classified by varieties—1937-38 season."
7. *Statistical Leaflet No.* 1.—Sixth Issue (1938-39), " Report on the staple length of the Indian cotton crop of 1938-39 season."
8. *Statistical Leaflet No.* 5.—Third Issue (1937-38), " Report on the accuracy of the all-India cotton forecasts of 1937-38 season."
9. *Statistical Bulletin No.* 8.—" Supply and distribution of the various types of Indian cotton during the season of 1937-38."

CHAPTER VI.

GENERAL.

It is proposed here to give a general account of such other activities of the Committee as have not been described in the previous chapters.

1. Better Marketing.

The Committee realised at the outset that the production of a better variety of cotton will not alone solve the entire cotton problem. Improvement in the science and practice of agriculture must go hand in hand with improvement in the method of disposal of the produce if permanent success is to be achieved. With full appreciation of these factors, much attention has been devoted by the Committee to the improvement of primary cotton marketing. The success achieved in this direction has been very marked. Regulated cotton markets existed in Berar before the establishment of the Indian Central Cotton Committee and that system which had stood the test of time was commended with certain modifications for general adoption. Legislation for the establishment of regulated cotton markets has been enacted in Bombay and the Central Provinces. In Madras, the establishment of regulated cotton markets is provided for under the Commercial Crops Markets Act. Hyderabad, Indore and some other Indian States have passed similar legislation, and open markets have been established. Investigations into the financing and marketing of cultivators' cotton conducted by the Committee have established beyond doubt that, in those tracts where regulated markets exist, the cultivators obtain better prices for their cotton. Based on these findings, recommendations have been made to provincial Governments for the establishment of regulated markets.

During the year under review, three new markets were established under the Bombay Cotton Markets Act, *viz.*, at Hubli, Gadag and Nargund, thus bringing the total number of such markets to twelve.

In the Madras province, Nandyal and Adoni Municipalities have also been notified as markets for cotton under the Madras Commercial Crops Markets Act; at Tirupur a regulated cotton market has been in existence since 1933.

During the year under report, there were eight regulated cotton markets in the Central Provinces, *viz.*, at Pulgaon, Wardha, Arvi, Hinganghat, Chanda, Warora, Sindi and Deoli. The District Council of Hoshangabad has also agreed to establish regulated cotton markets at Timarni and Khirkiya in the Hoshangabad District. Proposals for the opening of regulated cotton markets at Khandwa, Burhanpur, and Bir in the Nimar District, and at Chhapra in the Chhindwara District are under consideration. The provincial Government

observe that on account of general failure of cotton crop in the province and continued economic depression, arrivals of cotton carts are falling from year to year, and that local bodies, owing to financial stringency, are reluctant to establish separate cotton markets. For these reasons, comprehensive enquiries will be undertaken by the provincial Government to ascertain the financial stability of a cotton market before bringing it within the purview of the Act. The progress in the establishment of regulated cotton markets in the province is, therefore, likely to be somewhat slow.

In the Punjab, the Punjab Agricultural Produce Markets Act has been passed, providing for the better regulation of the purchase and sale of, and the establishment of markets for, agricultural produce including cotton. Rules under the Act have, however, yet to be framed before the Act can be put into force.

The framing of rules under the Baroda Agricultural Produce Act is still under consideration. The Act was once applied to the Amreli *taluka* of the State, but was subsequently withdrawn.

During the year, the Hyderabad Agricultural Markets Act was in operation at the following fifteen markets: Aurangabad, Jalna, Partur, Silu, Hingoli, Nanded, Umri, Bhainsa, Nizamabad, Adilabad, Warangal, Khammam, Raichur, Badepalli and Latur. The Act is applicable to all important agricultural produce, including cotton.

In Sangli State a Huzur Order regulating the sale and purchase of commercial crops in the State is in force.

In connection with the adoption of a definite cotton policy in Gujerat, one of the views expressed was that, as the crux of the whole problem centred round the better marketing of *1027 A. L. F.* cotton, the Agricultural Produce (Grading and Marking) Act should be utilised to enable this cotton to be marketed as a special grade of Surat cotton. The Government of India were accordingly requested to include cotton in the schedule to the Act to enable specified varieties of cotton to be protected under it, the intention being that once cotton is included in the schedule, specified varieties of cotton produced in specified areas could then be stamped with a special mark, the unauthorised use of which would be illegal under the Act. The Government of India have accepted the Committee's recommendation and have issued a notification applying the provisions of the Act to cotton. The draft rules* under the Act framed by the Agricultural Marketing Advisor to the Government of India were approved by the Committee with certain modifications which have been accepted. The rules have now been finally published.

2. Universal Standards for Indian Cottons in India.

Prior to 1933, standards for Indian cotton were prepared by the East India Cotton Association and the Karachi Cotton Association. The latter

*Appendix IX.

Association prepares standards for *Bengals*, Sind, Punjab-American and Sind-American cottons, whilst the former had standards for these as well as other varieties. As, however, the standards prepared by these two Associations in respect of the same varieties of cotton were different and resulted in a certain amount of competition between the two markets, the position was considered to be detrimental to the interests of the cotton grower. It was, therefore, decided that the Committee should take up, in co-operation with the two Associations concerned, the question of having standards adopted which would be of universal application in India. The two Associations were approached in the matter, and with their co-operation for the first time, standards common to the Bombay and Karachi markets were prepared by a Special Sub-Committee of the Indian Central Cotton Committee known as the Standards Sub-Committee. The preparation of these standards has now become an annual feature of the activities of the Committee. During the year, universal standards for the following varieties of cotton were prepared :—

1. *Bengals*,
2. Sind,
3. Punjab-American,
4. Sind-American,
5. *Oomras*,
6. *Mathias*,
7. Broach,
8. *Dholleras*,
9. *Kumptas*.

During the year under review, the Committee accepted the recommendation of the Standards Sub-Committee that from the 1939-40 season universal standards should be prepared also for *4F* Saw-ginned Punjab, *289F* Roller-ginned Punjab and Sind, and *289F* Saw-ginned Punjab and Sind.

The Karachi Cotton Association have now adopted the universal standards of the Committee as the basis for their own standards. The Committee has also recommended to the East India Cotton Association that trading in the Bombay market should be transacted on the basis of the universal standards of the Committee.

The Standards Sub-Committee while passing the universal standards for Berars and Broach for the 1938-39 season also compared the standards of the Liverpool Cotton Association for those cottons and expressed the view that the Liverpool standards were much inferior to and not at all representative of the actual growth of Berars and Broach. The matter has accordingly been taken up with the Liverpool Cotton Association and arrangements have been made for the supply to them of copies of sets of standards used by the respective Associations in India ; universal standards of the 1939-40 season of Broach and *Oomras* cottons will be supplied by the East India Cotton Association and those of *Bengals*, Sind, Saw-ginned Punjab-American and Roller-ginned Punjab-American by the Karachi Cotton Association.

3. Cotton Control Act.

With a view to checking the spread of undesirable or inferior types of cotton and insect pests and diseases, Cotton Control Acts have been introduced in the various provinces.

Madras Cotton Control Act.—This Act, which came into force in 1932, prohibits the cultivation and mixing of the short staple *neglectum* cotton, locally known as *pulichai*, in the long staple cotton growing tracts producing *Tinnevellies*, *Karungannis* and *Cambodias*. In the Tinnevelly District fifty-seven prosecutions were launched against cultivators for growing *pulichai* cotton either pure or mixed with other cottons; in most cases the plants were pulled out. One gin owner was prosecuted for being in possession of this cotton.

Bombay Cotton Control Act.—To check the spread of *goghari*, a short staple high ginning *herbaceum* cotton, which threatened to invade the long staple cotton areas in Gujerat, the Bombay Government passed the Bombay Cotton Control Act in 1935 under which the cultivation, mixing or possession of *goghari* in specified areas is a penal offence. As a result of the introduction of the Act and vigorous propaganda by the Agricultural Department, *goghari* has completely disappeared from the areas where it was at one time extensively grown. During the year under review, the Act is reported to have worked satisfactorily in the area south of Narmada. There is, however, the potential danger of the spread of another variety inferior to *1027 A.L.F., viz.*, Selection *1A*, in parts of the Surat district where *goghari* was formerly grown, and, if the extension of this cotton is to be controlled, the Act would require to be so amended as to empower the provincial Government to prohibit the cultivation and handling of any specified type or types of cotton the spread of which the provincial Government may desire to restrict.

Central Provinces Cotton Control Act.—This Act, which was passed into law towards the end of 1936, has for its object the elimination, from the Central Provinces and Berar, of garrow hill cotton, a very inferior, coarse but prolific variety, which threatens to mar the reputation of the Central Provinces cotton and thus to nullify the efforts of the Agricultural Department in the matter of cotton improvement. The Act has been applied for a period of five years to the districts of Nagpur, Wardha, Amraoti, Yeotmal, Buldhana, Akola and Nimar and the Sansar *tehsil* of Chhindwara district. The application of the Act late in the 1938 season gave little time to the Department of Agriculture to carry on propaganda among the cultivators with the result that the area under garrow hill during the season was not much affected. From the beginning of 1939, however, systematic propaganda has been carried out by the Department and the area under *V. 434* has considerably increased. It is hoped that in the course of a few years garrow hill will gradually disappear.

Baroda Cotton Control Act.—The Bombay Cotton Control Act of 1935 has, by a notification of the Baroda State, dated the 25th April 1936, been applied with certain modifications to meet the requirements of the State. This Act prohibits the cultivation of *goghari* cotton in the Navsari District of the State. Subsequent observations have shown that the presence of this cotton, even in field sowings, was very small, thus proving that the introduction of this Act has been effective in eliminating *goghari*.

Bhopal Cotton Control Act.—The Bhopal Cotton Control Act, which was enacted in April 1937 aims at promoting the cultivation of superior cottons and prohibiting the growing of inferior cottons in the Bhopal State. The State Department of Agriculture is working out a scheme to ensure an adequate supply of pure seed. This is expected to be completed in two or three years when the Act will be put into force.

United Provinces Cotton Pest Control Act.—As reported last year, this Act has been passed into law and rules* have been framed under it. These await the approval of the legislature before the Act can be put into force.

4. Cotton Transport Act.

The clean-up measures described above may be considered as being largely supplemented to the Cotton Transport Act which was passed by the Central Government in 1923 at the instance of the Indian Central Cotton Committee. This Act enables provincial Governments to prohibit the import of cotton, *kapas* or seed into specified areas from outside unless required for a special purpose and covered by a license. Under this Act, protected areas have been notified in the provinces of Bombay, Madras and the Central Provinces, and Berar as also in the States of Hyderabad, Baroda, Indore, Gwalior, Rajpipla, Sangli, Chhota Udepur, Lunawada, Bhaderwa, Kadana, Sant, Sanjeli, Jambughoda and Baria. A brief account of the working of the Act in the Provinces and States is given below.

Bombay.—The protected areas in the Bombay province remained unchanged except that Olpad and part of the Chorasi *taluka* were isolated from the rest of the protected area lying south of the river Narmada. As a result of this, most of the co-operative cotton sale societies in Olpad have already taken up the cultivation of the improved *1027* cotton. The question of amending the Bombay notification under the Cotton Transport Act to enable half-pressed bales from Vyara and some other stations in Baroda State Territory to be imported into the corresponding Surat protected area in British Territory without license is still under consideration of the Bombay Government.

Madras.—The Act worked smoothly and there was no change in the protected areas.

Central Provinces.—The protected areas in the Central Provinces and Berar remained unchanged in the year under review.

The protected areas in the Hyderabad, Baroda, Rajpipla, Sangli, Chhota Udepur, Baria, Lunawada, Sanjeli and Jambughoda States remained unchanged during the year.

The protected area in the Indore State remained unaltered. The question of amplifying the Act wherever possible, mentioned in last year's report, is still under the consideration of the State authorities.

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*Appendix X.

Gwalior State.—The Gwalior State have issued a notification prohibiting the import of Rajputana cotton into the State and declaring the districts of Shajapur, Ujjain, Mandsaur and Sardarpur to be protected areas. The Government of India have also issued notifications prohibiting the despatch by rail of Rajputana cotton from Rajputana and Central India Railway lands and from railway stations in British India lying outside the notified area to certain specified railway stations in Gwalior State. In view of these measures, the East India Cotton Association, at the instance of the Committee, have included the stations Khachrod, Barnagar, Shujalpur, Bercha, Agar, Bajana, Bhesoda, Gangapur, Jawad, Rajgarh, and Sardarpur in the list of places, cotton from which is tenderable against F. G. M. G. *Oomra* Hedge Contract.

5. Cotton Ginning and Pressing Factories Act.

The Cotton Ginning and Pressing Factories Act, 1925, applies to the whole of British India and practically all cotton growing Indian States have passed similar legislation. This Act requires every bale of cotton to be stamped with a special mark showing where it was pressed; the Act also regulates certain matters connected with the management of cotton ginning and pressing factories and makes compulsory the submission by pressing factories of weekly returns of cotton pressed. Modifications in the Rules have been called for from time to time, but the working of the Act has undoubtedly been a salutary check on malpractices.

During the year under report, complaints were received from Manchester regarding certain shipments of Indian cotton in which several bales were found damaged by stencil marks on the uncovered ends, or by paint marks on the sides not completely covered by canvas. The exporters and the manager of the pressing factory concerned were requested to take steps to avoid stencilling bales in a manner which results in trouble to the mills using such cotton, waste and consequent loss. The East India Cotton Association were also requested to draw the attention of shippers in Bombay to the complaints.

A case pertaining to indecipherable press marks filed against a factory was withdrawn on the advice of the Assistant Public Prosecutor, Ahmedabad, on the ground that the evidence of the then Secretary of the Committee, who made the report, was not recorded and that unnecessary expense and trouble would be involved in proceeding with the prosecution in the absence of conclusive evidence. On enquiry as to the nature of the evidence required to secure conviction, the Assistant Public Prosecutor expressed the opinion that the best evidence would have been the production of the hoops themselves or their photos coupled with the evidence of the seller, the survey clerk and one of the arbitrators of the East India Cotton Association. This opinion was forwarded to the East India Cotton Association for information.

Two cases of irregular marking of bales from Mirpurkhas and Tando Adam were brought to the notice of the authorities concerned. In the first case, no evidence was available as the pressing season was over, but instructions were issued for a watch to be kept on the factory. The fault in the

second case was attributed to the neglect of the labourers and the owner was warned.

Out of 70 Indian States which have, by legislation or executive orders, enforced in their territories the main provisions of the Cotton Ginning and Pressing Factories Act as applied to British India, weekly returns of cotton pressed were received from 65 ; in four States, pressing factories did not work during the year while in one, where legislation was recently introduced, the factory had not commenced work.

Amendment of the Act.—Reference was made in the last year's report to certain proposed amendments to Sections 9 and 14 of the Cotton Ginning and Pressing Factories Act, 1925, and to Rule 7 of the Rules framed thereunder. These amendments, as finally passed, are given in Appendix XI.

The draft of a Bill* for the further amendment of the Central Provinces Cotton Ginning and Pressing Factories Act to give effect to the recommendatoins of the Pools Committee appointed by the Provincial Government to examine the question of the effect of pools on ginning and pressing charges was approved by the Committee, subject to the following observations :—

(1) That Government should give protection to the existing factories by prohibiting the erection of new factories for a period of five years. The requirements of any area for more factories could be met by transference of some factories from areas where they are in excess.

(2)(*a*) That an appeal should be provided against the decision of the Rates Fixing Committees to a suitable agency like the Commissioner or the District Judge.

That rates should be fixed and published well in advance to allow time for appeal and that they should then be finally fixed two weeks before the commencement of the season, *i.e.*, before the *kapas* begins to arrive.

(*b*) That the Bill should state whether rates should be agreed upon unanimously or by a majority. To avoid any possible deadlock, it would appear to be desirable to provide for the fixation of rates on the basis of majority votes by rules under Clause 2B (7) of the Bill.

(*c*) That the rules to be made for the guidance of the committees should lay down that the committees would consider not only the costs of working of a particular gin or press but also the depreciation, etc., of the machinery of other gins and presses in the pool.

Licensing of ginning and pressing factories.—It was reported last year that the Government of the Central Provinces and Berar had enforced the provisions of the Cotton Ginning and Pressing Factories (Central Provinces

*Appendix (page XII).

Amendment) Act which *inter alia* prohibits watering, mixing and admixture of cotton and makes it obligatory on all cotton ginning and pressing factories situated in areas to which the Act is applied to obtain licenses for their working. During the year under report, similar legislation already passed by the Government of Bombay was put into operation by the promulgation of the necessary Rules.* The question of enforcing the provisions of the Cotton Ginning and Pressing Factories (Bombay Amendment) Act in Sind is still under the consideration of the provincial Government. Legislation for the licensing of ginning and pressing factories in Madras and the Punjab is under contemplation.

The Baroda Durbar have amended the Baroda Cotton Ginning and Pressing Factories Act, 1925, on the lines of the Bombay Amendment Act, 1936, whereby watering, mixing and admixture of cotton have been made penal offences and cotton ginning and pressing factories are required to obtain licenses for working. Rules under the Amendment Act† have, however, not yet been framed.

As the amended Act does not prohibit the mixing of cotton waste with cotton and deliberate watering of cotton, the Durbar have been requested to take steps to further amend the Act on the lines of the Bombay Amendment Act‡, 1938.

It may be expected that the application of the legislative measures referred to above and the firm action taken by the East India Cotton Association in dealing with watered, mixed or false-packed cotton when tendered against their contracts, will result in a steady improvement in the purity of Indian cotton.

Prevention of malpractices.—Complaints regarding the watering of cotton in Broach and in Baroda State forwarded by the East India Cotton Association were brought to the notice of the Director of Agriculture, Bombay, and the Commissioner of Agriculture, Baroda State, for enquiry and necessary action. Local investigations in Broach showed that water was being used before pressing by one factory but, as it was not possible to obtain evidence to justify a prosecution, the management of the factory was warned that the practice was illegal and should be stopped. To deal effectively with this malpractice in the Baroda State, steps have been taken to make the watering of cotton a penal offence by an amendment of the Baroda Cotton Ginning and Pressing Factories Act. A recommendation has also been made to the authorities in the Bombay province and Baroda State to be on the lookout for offences against the Act and to take strong action against such offences when detected.

Complaints received by the Committee regarding the presence of extraneous matter, such as pieces of jute and twine in cotton bales from Bhawalpur State, were brought to the notice of the State authorities who warned the factory owner concerned and also other factories in the State to keep a

* Appendix (page XIII). † Appendix (page XIV). ‡ (Printed-page 142.)

strict watch for extraneous matter in cotton received in their factories. The attention of the State was also drawn to the Bombay and Central Provinces Cotton Ginning and Pressing Factories (Amendment) Acts, which *inter alia* penalise foreign matter in cotton bales, and it was suggested that similar action might be taken by them.

Complaints of the same character were also received from the Manchester Cotton Association, Ltd., and the International Cotton Federation but as no particulars were supplied, these bodies were requested, when making complaints, to forward the press marks and running numbers of the bales complained of to enable the matter to be followed up. A similar request was made to Cotton Associations, Millowners' Associations and other commercial firms in India and it was further suggested that the exporter, merchant or spinner concerned should in such cases also complain to the factory in question to the effect that, if such malpractices continued, their cotton would not be purchased. In this connection, the Committee expressed the view that if in any particular season complaints received against a pressing factory exceeded a certain number, say 10, the provincial Government concerned should be requested to consider the question of stopping the factory from working during that season.

A representation regarding deterioration in Sind *Sudhar* cotton was considered by the Committee and as this was mainly attributed to mixing of varieties, the provincial Government were requested to apply the provisions of the Cotton Ginning and Pressing Factories (Bombay Amendment) Act to the province and to investigate the possibility of introducing a cotton control act for setting apart certain areas for the exclusive cultivation of long staple cottons.

6. Prevention of Introduction of Foreign Cotton Pests.

In order to prevent the introduction into India of the Mexican Boll-weevil (*Anthonomus grandis*) with imported American cotton, at the instance of the Committee, regulations have been imposed by the Government of India under which the import of American cotton into India is prohibited except through the port of Bombay where it must be fumigated with hydrocyanic acid gas before entry into the country. The work of fumigation is carried out under the technical supervision of the Committee, and the cost involved is met by the levy of a small fee from importers on each bale of American cotton fumigated. The imports of American cotton during the year under review amounted to 2,861 bales against 1,42,530 bales in the preceding year. A rebate of fumigation fees at the rate of five annas per square bale and three annas per round bale on all American cotton fumigated during the year ending 31st March 1938 was granted by the Government of India on the recommendation of the Committee and paid to the importers.

The Red (Sudan) Bollworm (Diparopsis castanea) and other pests.— The restriction on the import of foreign *kapas* (unginned cotton) and of foreign

cotton seed remained in force throughout the year. Thirty-six parcels of foreign cotton seed were received during the year, examined and fumigated, where necessary.

7. Collection and Supply of Information.

As usual, notes on the progress in the introduction of improved varieties of cotton in the provinces and Indian States and on the work of the Committee were supplied to the East India Cotton Association and the Karachi Cotton Association for publication. The weekly statements of purchases and arrivals of American cotton were published for general information. The names of pressing factories in Indian States with the requisite details regarding press marks, name of owner or occupier, etc., were communicated to the Director General of Commercial Intelligence and Statistics, Calcutta, for publication in the Indian Trade Journal and for incorporation in the all-India list of cotton ginning and pressing factories published by that Department.

During the year under review, several press notes and leaflets describing the various activities of the Committee and other matters of interest to the cotton industry in general were issued from time to time.

8. Publications.

Several important scientific and technical journals are received by the Committee, partly by subscription and partly on an exchange basis. These are circulated among its research workers who are thus afforded facilities for keeping in touch with the latest scientific literature which otherwise would not ordinarily be accessible to them.

The Committee desires to express its indebtedness to those institutions which have placed its name on their free mailing lists, in particular to the British Cotton Industry Research Association for its Summary of Current Literature and the Shirley Institute Memoirs, and to the Empire Cotton Growing Corporation, the British Cotton Growing Association and the East India Cotton Association and the Karachi Cotton Association, for the supply of their publications. The Committee also records its thanks to the Indian Trade Commissioner, London, the U.S.A. Department of Agriculture, U.S.A. Agricultural Experiment Stations, the Lingnan University, Canton, China, the National Agricultural Research Bureau, Ministry of Industries, Nanking, the Mitsubishi Economic Research Bureau, Tokio, Japan, the Egyptian Ministry of Agriculture, Technical and Scientific Service, the International Institute of Agriculture, Rome, the Liverpool Cotton Association, the Imperial Agricultural Bureau, London, the Imperial Bureau of Plant Genetics, Cambridge, the Manchester Cotton Association, the Textile Institute, Manchester, the Imperial Institute, London, the Indian Statistical Institute, the National Institute of Sciences, Calcutta, and other Associations and Chambers of Commerce for supplying the Committee with their reports, statistics and other valuable literature from time to time.

9. Research Students.

In the beginning, the Committee had perforce to undertake the training of research workers in the various branches of science pertaining to cotton for employment on its research schemes. Gradually, however, the necessity for this has disappeared, and scholarships are now, generally speaking, only granted whenever need arises for research workers with specialised training in a particular branch of science to meet the requirements of one or other of the Committee's schemes. Distinguished graduates are selected and placed for training under experienced research workers either on the Committee's schemes in the provinces, at the Institute of Plant Industry, Indore, at the Committee's Technological Laboratory or under professors in Indian Universities. Sometimes scholarships are also awarded for specialised training at recognised institutions abroad. The term of scholarship is usually two years, but extensions are sometimes sanctioned if found necessary. Scholarships are awarded under two categories, *viz.*, training grants, and general scholarships. The former are intended for Government servants who are recommended by provincial Governments and for employees of the Committee who are considered suitable. General scholarships are awarded to University Graduates who are selected by the Research Students Selection Sub-Committee. Applications for this class of scholarships are invited by advertisement.

Fifty-four scholarships and nine training grants have been awarded so far ; out of these, one scholarship and six training grants were for studies abroad. During the year under report, four research students were under training, two in India and two in England.

Expenditure on research studentships up to the 31st August 1939 amounted to Rs. 2,74,468.

10. Secretary's Tours.

During the year under report, the following places were visited by the Secretary in connection with the research, seed distribution and other schemes of the Committee :—

Indore, Lyallpur, Adoni, Raichur, Parbhani, Nanded and Coimbatore.

11. Financial.

In appendix XV will be found a statement showing the receipts and expenditure of the Committee and also the Balance Sheet for the year as at the 31st March 1939. Receipts during the year amounted to Rs. 7,53,429-13-11 and expenditure totalled Rs. 9,67,690-14-11.

D. N. MAHTA,
Secretary.

APPENDIX I.

MEMBERS OF THE COMMITTEE.

(1) PRESIDENT—

Mr. P. M. Kharegat, C.I.E., I.C.S., Vice-Chairman, Imperial Council of Agricultural Research, *ex-officio*.

(*a*) Dr. W. Burns, C.I.E., Agricultural Commissioner with the Government of India, *ex-officio*.

(2) REPRESENTATIVES OF AGRICULTURAL DEPARTMENTS—

Madras	Mr. P. H. Rama Reddi, I.A.S., Director of Agriculture.
Bombay	The Director of Agriculture.
United Provinces	The Director of Agriculture.
Punjab	The Director of Agriculture.
Central Provinces and Berar	Mr. R. H. Hill, Director of Agriculture.
Sind	Rao Saheb K. I. Thadani, Director of Agriculture.

(3) THE DIRECTOR-GENERAL OF COMMERCIAL INTELLIGENCE AND STATISTICS, *ex-officio*.

(4) REPRESENTATIVES OF CHAMBERS OF COMMERCE AND ASSOCIATIONS—

The East India Cotton Association ..	Sir Purshotamdas Thakurdas, C.I.E., M.B.E.
The Bombay Millowners' Association ..	Mr. S. D. Saklatvala, M.L.A.
The Bombay Chamber of Commerce ..	Mr. M. Durutti.
The Indian Merchants' Chamber ..	Mr. Chandulal P. Parikh, M.L.A.
The Karachi Chamber of Commerce ..	Mr. W. S. Priestley.
The Ahmedabad Millowners' Association	Mr. Kasturbhai Lalbhai.
The Tuticorin Chamber of Commerce ..	Mr. J. Vonesch.
The Upper India Chamber of Commerce	Captain S. R. Pocock, M.C., M.L.A.
The Empire Cotton Growing Corporation	Sir William Roberts, C.I.E.

(5) COMMERCIAL REPRESENTATIVES NOMINATED BY CENTRAL GOVERNMENT—

Central Provinces and Berar	Rao Saheb P. V. Deshmukh. Vacant.
Madras	Mr. G. A. Bambridge.
Punjab	Mr. Balak Ram.
Bengal representative	Mr. Girija Prosanna Chakraverty.

(7) CO-OPERATIVE BANKING REPRESENTATIVE—

Sir Chunilal V. Mehta, K.C.S.I., (*Vice-President.*)

(8) REPRESENTATIVES OF COTTON-GROWING INDUSTRY—

Madras	M. R. Ry. V. C. Palaniswami Gounder, Avl., M.L.A. M.R.Ry. H. Sitarama Reddy Garu, M.L.A.

Bombay	Mr. Yashwantram Rajaram Joshi. Mr. Mangesh Babhuta Patel, M.L.A.
United Provinces	Chaudhari Shivamangal Singh, M.L.A. Rai Bahadur Kunwar Laxmiraj Singh, M.L.C.
Punjab	Sardar Bahadur Gurbachan Singh, M.L.A. Ch. Mohammad Yasin Khan, M.L.A.
Central Provinces and Berar	Vacant. Vacant.
Sind	Mr. Roger Thomas.

(9) AND (10) REPRESENTATIVES OF INDIAN STATES—

Hyderabad State	Mr. Nizam-ud Din Hyder, Director of Agriculture.
Baroda State	Mr. R. G. Allan, C.I.E., Commissioner of Agriculture.
Gwalior State	Lt. Sardar D. K. Jadhav, Director of Agriculture.
Rajputana and Central India States ..	Mr. T. R. Low, I.A.S.

(11) ADDITIONAL MEMBERS NOMINATED BY THE GOVERNOR-GENERAL IN COUNCIL:—

1. Rao Bahadur S. S. Salimath, Deputy Director of Agriculture, Southern Division, Dharwar.
2. Mr. T. G. Rama Iyer, Director of Agriculture in Mysore, Bangalore.
3. Rao Bahadur V. Ramanatha Ayyar Avl., Cotton Specialist, Coimbatore.
4. Rai Bahadur S. V. Kanungo, Revenue Minister, Holkar State, Representative of the Holkar State.
5. Seth Isserdas Varindmal, M.L.A., Representative of the Karachi Indian Merchants' Association.
6. Dr. B. L. Sethi, Economic Botanist (Cotton & Rabi Cereals) to the Government of United Provinces, Cawnpore.
7. The Hon'ble Mr. V. Ramadas Pantulu, President, Madras Provincial Co-operative Bank, Madras.
8. Lala Shri Ram, Representative of the Cotton Millowners of Delhi.
9. Mr. Chellaram Shewaram, Representative of the Karachi Cotton Association, Ltd.
10. Dewan Bahadur Sir T. Vijayaraghavacharya, K.B.E.
11. Mr. H. B. Rajdev, Deputy Director of Agriculture, Karnatak Division, Raichur.
12. Sardar Rao Bahadur Bhimbhai R. Naik, Sagrampura, Surat.
13. Dr. T. E. Gregory, Economic Adviser to the Government of India.

APPENDIX II.

Constitution of Sub-Committees.

Agricultural Research Sub-Committee.

I. *The President.*—Mr. P. M. Kharegat (*ex-officio*).

II. *The Vice-President*
III. *The Co-operative Banking Representative.* } Sir Chunilal V. Mehta (*ex-officio*)

IV. *Cotton Growers' Representatives.*—Sir William Roberts, Sardar Rao Bahadur Bhimbhai Ranchodji Naik, Mr. Roger Thomas.

V. *Cotton Trade Representatives.*—Sir Purshotamdas Thakurdas, Mr. Kasturbhai Lalbhai, Mr. Chandulal P. Parikh, Mr. J. Vonesch, Mr. M. Durutti.

VI. *Agricultural Officers.*—The Agricultural Commissioner with Government of India (*ex-officio*), Mr. H. R. Stewart, Mr. W. J. Jenkins, Mr. P. H. Rama Reddi, Mr. R. G. Allan, The Director, Institute of Plant Industry, Indore (*ex-officio*), Rao Saheb K. I. Thadani, Mr. Nizam-ud Din Hyder, Rao Bahadur V. Ramanatha Ayyar, Sardar D. K. Jadhav, Dr. B. L. Sethi, Vacant (three seats).

VII. *Additional members.*—Dewan Bahadur Sir T. Vijayaraghavacharya, Mr. Chellaram Shewaram, Mr. Mohammad Afzal, Mr. K. Ramiah, Rai Saheb Kalidas Sawhney, Professor R. H. Dastur.

VIII. The Secretary.

Local Sub-Committee.

The President, (Mr. P. M. Kharegat),
The Vice-President, (Sir Chunilal V. Mehta),
Sir Purshotamdas Thakurdas,
Mr. S. D. Saklatvala,
Mr. Kasturbhai Lalbhai,
Mr. J. Vonesch,
Mr. M. S. Durutti,
Mr. Chandulal P. Parikh,
Mr. W. J. Jenkins,
Mr. W. S. Priestley.
Sardar Rao Bahadur Bhimbhai R. Naik,
Vacant (one seat).

Technological Research Sub-Committee.

The President, Mr. P. M. Kharegat (*ex-officio*),
The Vice-President, Sir Chunilal V. Mehta (*ex-officio*),
The Agricultural Commissioner with the Government of India (*ex-officio*),
Sir Purshotamdas Thakurdas,
Dewan Bahadur Sir T. Vijayaraghavacharya,
Mr. S. D. Saklatvala,
Mr. Kasturbhai Lalbhai,

Lala Shri Ram,
Mr. H. R. Stewart,
Mr. W. J. Jenkins,
Mr. P. H. Rama Reddi,
Mr. Chandulal P. Parikh,
Mr. M. S. Durutti,
Capt. S. R. Pocock,
Mr. J. Yonesch,
Rao Saheb P. V. Deshmukh,
Mr. E. F. G. Gilmore,
Dr. Nazir Ahmad,
Dr. B. L. Sethi,
Mr. F. Stones, Mr. A. D. Walwyn (Representing the Bombay Millowners' Association),
Seth Nanddas Haridas, Seth Shantilal Mangaldas, (Representing the Ahmedabad Millowners' Association),
Mr. R. G. Saraiya, Jamnadas Ramdas (Representing the East India Cotton Association, Ltd.),
Mr. T. B. Dalal (Representing the Karachi Cotton Association, Ltd.)

WIDER MARKETS SUB-COMMITTEE.

The President—Mr. P. M. Kharegat,
The Vice-President—Sir Chunilal V. Mehta,
Sir Purshotamdas Thakurdas,
Dewan Bahadur Sir T. Vijayaraghavacharya,
Dr. John Matthai,
Mr. S. D. Saklatvala,
Mr. Kasturbhai Lalbhai,
Dr. W. Burns,
Dr. T. E. Gregory,
Mr. H. R. Stewart,
Mr. W. J. Jenkins,
Sir William Roberts,
Mr. P. H. Rama Reddi,
Sardar Rao Bahadur *Bhimbhai Ranchodji Naik*,
Mr. Chandulal P. Parikh,
Mr. M. S. Durutti,
Seth Isserdas Varindmal,
Rao Saheb K. I. Thadani,
Mr. Nizam-ud Din Hyder,
Rao Saheb P. V. Deshmukh,
Mr. Balak Ram,
Dr. Nazir Ahmad,
Mr. R. G. Saraiya—additional member.
Vacant (four seats).

STANDARDS SUB-COMMITTEE.

Mr. Roger Thomas (Representing the Imperial Council of Agricultural Research),

Mr. Haridas Madhavdas, Mr. Varjivandas Motilal (Representing the East India Cotton Association),

Mr. L. H. Johnson, Mr. Chellaram Shevaram (Representing the Karachi Cotton Association, Ltd.),

Rao Bahadur Sir Madhaorao Deshpande, Mr. M. P. Kolhe (Representatives of Cotton Growers of Berar Tract),

Mr. Y. R. Joshi, Mr. A. J. Kapadia, (Representatives of Cotton Growers of Broach Tract),

Mr. Mulchand V. Shah, Mr. H. T. Vadodaria (Representatives of Cotton Growers of Mathia Tract),

Rao Bahadur S. J. Deshmukh, Mr. S. B. Betgiri (Representatives of Cotton Growers of Kumpta Tract).

COTTON FORECAST IMPROVEMENT SUB-COMMITTEE.

The President (*ex-officio*),

The Agricultural Commissioner with the Government of India (*ex-officio*),

The Director-General of Commercial Intelligence and Statistics,

The Director of Agriculture, Bombay Presidency,

,, ,, Punjab,

,, ,, Madras,

,, ,, United Provinces,

,, ,, Central Provinces and Berar,

,, ,, Sind,

,, ,, H. E. H. the Nizam's Government,

The Commissioner of Agriculture, Baroda,

The Director of Statistics, H. E. H. the Nizam's Government,

The Director of Land Records, Central Provinces and Berar,

The Deputy Director of Statistics, Department of Commercial Intelligence and Statistics,

The Statistical Officer to the Director of Industries, Madras,

Mr. J. Vonesch,

Dr. T. E. Gregory.

RESEARCH STUDENTS SELECTION SUB-COMMITTEE.

The President—Mr. P. M. Kharegat,

The Vice-President—Sir Chunilal V. Mehta,

Sir Purshotamdas Thakurdas,

Dewan Bahadur Sir T. Vijayaraghavacharya,

Mr. Kasturbhai Lalbhai,

Dr. W. Burns,

Mr. H. R. Stewart,

Mr W J. Jenkins,
Mr. P. H. Rama Reddi,
Rao Saheb K. I. Thadani,
Mr. R. G. Allan,
Mr. T. R. Low,
Mr. Nizam-ud Din Hyder,
Dr. Nazir Ahmad,
Mr. K. Ramiah,
Seth Isserdas Varindmal,
The Secretary.
Vacant (three seats).

COTTON GINNING AND PRESSING FACTORIES SUB-COMMITTEE.

The Vice-President,
The Co-operative Representative,
} Sir Chunilal V. Mehta (*ex-officio*),
Sir Purshotamdas Thakurdas,
Mr. S. D. Saklatvala,
Mr. Kasturbhai Lalbhai,
Mr. M. S. Durutti,
Sir William Roberts,
Mr. W. J. Jenkins,
Rao Saheb P. V. Deshmukh,
Mr. Chellaram Shewaram,
Vacant (three seats.)

APPENDIX III.

Report of the Special Sub-Committee on the Present Position of Indian Cotton (as amended and adopted by the Indian Central Cotton Committee at its meeting on the 31st March 1939).

Present :—

Sir Chunilal V. Mehta, K.C.S.I., (*Vice-President*), in the Chair,
Sir Purshotamdas Thakurdas, C.I.E., M.B.E.,
Dr. W. Burns, C.I.E.,
Mr. W. J. Jenkins,
,, P. H. Rama Reddi,
,, H. R. Stewart,
,, J. Vonesch,
,, Roger Thomas,
,, J. C. McDougall,
Rao Saheb K. I. Thadani,
Mr. Nizam-ud-Din Hyder,
,, Chandulal P. Parikh,
,, R. G. Allan, C.I.E.,
Lt. Sardar D. K. Jadhav,
Mr. T. G. Rama Iyer,
,, T. R. Low,
Rao Bahadur V. Ramanatha Ayyar,
Mr. A. P. Darlow,
Rai Saheb Kalidas Sawhney,
Mr. H. B. Rajdev,
Dr. Nazir Ahmad, O.B.E., and
The Secretary.

The Special Sub-Committee met at 11 A.M. on Monday the 27th March 1939 and concluded its deliberations at 5-30 P.M. the following day.

The discussion dealt with the following points :—

(1) The need for securing a better balanced production of different cottons.
(2) Raising the efficiency of cotton cultivation.
(3) Restriction of cotton cultivation on marginal lands.
(4) Finding of alternative uses for short staple cotton.
(5) Intensification of efforts to check malpractices and improvement of marketing to ensure that cottons reach spinners in pure condition to enable their being put to optimum use.
(6) Import duty on foreign cotton.
(7) Reduction in railway freight rates on cotton.
(8) Enhancement of import duty on rayon yarn.
(9) Division of areas into zones for growing long, medium and short staple cottons.
(10) Hedging facilities.
(11) Conference of the main cotton growing countries to regulate production and export.
(12) General.

(1) *The need for securing a better balanced production of different cottons.*

The Sub-Committee noted that there had been a definite increase in the proportion of long staple cottons in the Punjab. The total area under cotton had reached nearly 3 million acres, of which 51%, was under medium and long staple cottons. Out of this 51%, 25% was under such cottons as L.S.S., 289F, 289F/43, etc. In view however of the setback which these cottons had received as a result of low prices last year, it was not certain that this position would be maintained. Further, it was pointed out that there was no indication, at the present moment, of any material being available amongst the Punjab-American varieties, which might be capable of producing a reasonably average crop on poorly irrigated light sandy soils which grow *desi* cotton.

The view was expressed that the difficulty created in the Indian market by *Oomras* types of cotton could be relieved by a switch over from *desi* to Punjab-American in the Punjab and Sind. In this connection, the need for intensive propaganda to extend the cultivation of American types, especially those having one inch staple and over, in the Punjab and the adjoining States was stressed and it was suggested that the possibility of obtaining suitable breeding material in the same way as had been done in China, Russia and the Sudan should be investigated. The Sub-Committee, however, felt that unless a cotton can be produced which could be marketed to the advantage of the cultivator there was not much prospect of any immediate 'change over.' It was not merely a matter of staple length; spinning qualities and ginning percentage, both required to be taken into account.

Several trade members were against the elimination of Sind *desi*, on the ground that it was never a drag on the market, could be sold easily and regularly and in some years even fetched the same price as the ordinary Sind-American cotton. The suggestion to replace 4F also did not find much favour; it was explained that this cotton was being used by the mills for spinning counts of about 16's to 20's and its replacement by a cotton of 1" would cause serious difficulty in filling the gap.

An important query raised was whether in the opinion of the Committee the Indian cultivator, if he grew an excessive quantity of staple cotton, would be in a position to compete with countries which produce nothing but American cotton. It was pointed out that the United States of America, despite deliberate and planned large reduction of acreage, had produced 11 million bales of staple cotton and that comparatively speaking, the Indian cultivator had marketed his present crop much quicker and better than the American farmer. This was a factor which should not be lost sight of, as there was likelihood of similar conditions prevailing for a number of years to come.

After further discussion, *the Vice-President* moved the following resolution, which was seconded by *Mr. Roger Thomas* and carried unanimously:—

RESOLUTION 1.—"This Sub-Committee is of the opinion that while satisfactory progress in the matter of replacement of short staple cotton by long and medium staple cotton has been made during the past few years, further investigations in this connection appear necessary and the process of better balancing of short and long staple cottons in India should continue. With this object, efforts should be made to obtain fresh breeding material from all possible sources. The Sub-Committee feels, however, that the advantages of the change to the cultivator should, at no stage, be overlooked and due consideration should continually be given as to what would be the most paying type of cotton for him to grow in the long run."

(2) *Raising the efficiency of cotton cultivation.*

The Sub-Committee discussed this subject from the standpoint of greater yield and lower cost of production. It was explained that the introduction of improved types of cotton would be greatly facilitated and more money put into the cultivator's pocket if the general yield of the tract could be raised. The need for greater attention to crop rotation, improvement in local tillage practices, bunding and better cultivation was emphasised. It was pointed out that the Dry Farming Research at Sholapur had shown indications that the yield could be raised by 50 to 100% by the construction of small field bunds. Much

could be achieved in this direction if in the major cotton growing tracts such work were done by the cultivators themselves with the cotton best suited to the area and in accordance with the approved methods or tillage. In this way, not only would astonishingly good results be obtained in the matter of raising the yield but the procedure would at the same time prove a valuable method of propaganda in the extension of better methods of cultivation amongst the growers. Much stress was laid on the importance of checking soil erosion, the work done at Hagari being quoted as an instance of what can be done in this connection; here by means of bunding it had been possible to increase the yield by nearly 50%.

The view was expressed that seed improvement offered one of the easiest and cheapest methods of improving the yield and that for areas where the crop was dependent on rainfall an improved system of rotation was interplanting instead of crop-sequences.

It was suggested that as part of 'Land Use Programme,' the Sub-Committee should recommend that more attention should be given to the improvement of cotton cultivation. The following measures were considered to be specially suitable for such a movement :—

(i) Starting of cotton cultivation on complete holdings or preferably in villages managed by cultivators themselves according to the best system devised by the local Agricultural Department.

(ii) Undertaking of soil conservation measures, where applicable.

(iii) Keeping of accounts as to expenditure and income of such holdings.

It was pointed out that Local Governments were committed both in principle and finance to some form of rural reconstruction and this would appeal to them straightaway. With regard to the question of cost, there were two great untapped sources which should be utilised. One was the large amount of spare time which the cultivator had, as had been found by the 'Cost of Production Enquiry' and the other the huge waste of vegetable material, which by composting could be converted into valuable manure. Stress was laid on the value and importance of local leadership in such matters. As regards the financing of schemes outlined above, it was for the Provinces and States to put up model projects for consideration by the Committee. The latter could then give indication of the help that it would be prepared to give for the working of the scheme. This procedure would also enable the model projects from Provinces and States to be compared with a view to seeing to what extent there was similarity and what co-ordination was possible.

After further discussion, the *Vice-President* moved the following resolution which was seconded by *Mr. Jenkins* and carried unanimously :—

RESOLUTION 2.—" This Sub-Committee notes that, while as a result of the joint efforts of the Indian Central Cotton Committee and the Provincial Departments of Agriculture, some improvement in the outturn of cotton per acre in India has taken place, the yield still compares very unfavourably with other countries and in many areas is extremely low. It, therefore, recommends :—

(i) the starting in major cotton growing tracts of cotton cultivation projects which would be complete holdings or preferably villages managed and cultivated by the cultivators themselves according to the best system advised by the local Agricultural Department and where the results of research work could be concentrated in practice and demonstrated to growers under cultivators' conditions with the improved type or types of cotton best suited to each tract,

(ii) the keeping of accounts giving information as to the expenditure and income of the projects referred to above.

The Sub-Committee further recommends that such work should be carried out by the Provincial Departments of Agriculture in collaboration with the Indian Central Cotton Committee in selected holdings or villages."

Mr. Roger Thomas urged the desirability of greater degree of guidance and direction to cotton breeders in their breeding work. He laid emphasis on the need for close

systematised collaboration with other technicians, *viz.*, entomologists, bacteriologists, chemists and agronomists, and on the supply of information over a period of years pertaining to the region in which breeding work is being done, the limitations of the tract, environmental conditions, rainfall, acre production, pests and diseases, adverse climatic factors and the type of soils, etc.

In view of the complexity of the problem, it was decided that Mr. Roger Thomas should prepare a note on the subject for consideration at the next meeting of the Committee.

Stress was laid on the desirability of obtaining fresh breeding material showing variability and combining resistance to drought and disease with good ginning percentage, lint length, etc. It was suggested that such material might be obtained from foreign countries such as Mexico, Columbia, parts of South America, Russia, and Africa, and that a special expedition should be sent for the purpose.

After further discussion, the following resolution was passed :—

RESOLUTION 3.—" The Sub-Committee recommends that the President of the Indian Central Cotton Committee should get into touch with the Russian Institute of Plant Breeding, Tashkent, and see what can be done in the way of getting seeds of cotton varieties collected in their present expedition. It is also suggested that the Imperial Bureau of Plant Genetics (Cambridge) be asked to give all possible information and help.

" Thereafter the question of a special expedition should be reconsidered, if necessary."

It was decided that as the cost of the proposed expedition would be very high, enquiries should be made of Provincial Governments whether they would be prepared to share the expenditure with the Committee, should such an expedition be decided on.

(3) *Restriction of cotton cultivation on marginal lands.*

Consideration was given to the practice reported to be gaining ground in America of putting marginal lands under timber and allowing grass to grow on such lands in order to restore their fertility for growing cereal crops. It was suggested that experiments of this type might be tried in India.

The general opinion of the Sub-Committee was that curtailment of acreage in India seemed to offer no great advantage but that if an international conference were held with the object of restricting cotton production, India should take part in it.

It was decided that the question of withdrawing marginal lands from cotton cultivation and putting them for purposes such as grazing growth of fuel or fodder trees and crops for livestock with a view to building up soil fertility and preventing soil erosion should be investigated in connection with the model projects proposed.

(4) *Finding of alternative uses for short staple cotton.*

Attention was drawn to the fact that in America, where the problem of short staple cotton was not so important, about 30 different uses had been found for cotton, and in view of the potential danger to Indian cotton from the substitution of alternative fibres or decline in prices, the appointment of a Sub-Committee to examine the several uses, other than textile, to which cotton could be put, was suggested.

It was decided that as a first step the Director, Technological Laboratory, with the help of Mr. D. L. Sen, Chemist, should prepare a note on the subject for consideration at the next meeting of the Technological Research Sub-Committee.

(5) *Intensification of efforts to check malpractices and improvement of marketing to ensure that cottons reach spinners in pure condition to enable their being put to optimum use.*

Attention was drawn to the fact that Sind 4F grown on the Right Bank was being brought to the Left Bank for mixing with Sind Sudhar and other 289F types which, as a result, got a bad name. It was mixing which was partly responsible for the complaint that Sind cotton was deteriorating. It was a matter of regret that the application of the Cotton Ginning and Pressing Factories Act, which could put a stop to this mixing, was being opposed by ginowners and its repeal urged.

It was emphasised that legislation was necessary to effectively stop the malpractices. It was, however, pointed out that an important seed scheme was being held up pending the application of the Act and that the matter would be emphasised in a Press Communiqué to be issued by the Secretary or otherwise.

The following resolution was passed :—

RESOLUTION 4.—" The Sub-Committee re-iterates the view it has expressed on several occasions that there should be no relaxation of efforts to reduce mixing and other malpractices which prevent certain Indian cottons from being used to the best advantage and which adversely affect the cultivator. It therefore recommends that wherever possible the Cotton Transport Act as well as the Cotton Control Act and the Cotton Ginning and Pressing Factories Act should be applied."

(6) *Import duty on foreign cotton.*

It was stated that there was a general impression in the country that the additional import duty on cotton would promote the cultivation of staple cotton but this view was not shared by the commercial community since the cotton on which the duty would be levied did not compete directly with Indian cotton. It was felt that the duty would not help the cultivator unless it was linked with a corresponding duty on imported cotton yarn and cloth. The doubling of the duty, it was argued, would disable Indian mills, the best customer of Indian cotton, and favour cotton going from India to Lancashire to be spun into yarn and returned to India. It would affect not only the manufacturing industry of India but also the hand weaving industry.

After some discussion the following resolution was passed by a majority :—

RESOLUTION 5.—" This Sub-Committee is of the opinion that the recent increase in import duty on foreign cotton to be effective in helping the production of long staple cotton in India should have been accompanied by restriction on the import of foreign yarn and cloth or a corresponding increase in duty on such imports."

Dr. Burns abstained from voting.

The Sub-Committee desired that the Secretary should attach to the report of the Sub-Committee a note summarising the opinions expressed at several meetings of the Committee on the above subject. This has been done (Enclosure I).

After considerable discussion the following further resolution was passed by a majority :—

RESOLUTION 6.—" The Indian Central Cotton Committee desires to place it on record that it has not recommended an increase in the duty on all foreign cotton. It re-iterates the view expressed in 1937 and 1938 that should the parity of Indian and imported cotton move to a point justifying such action the import duty should be increased on all cottons which compete with Indian Cotton, i.e., cottons below 1" staple at present."

(7) *Reduction in Railway freight rates on cotton.*

The attention of the Sub-Committee was drawn to the anomaly that freight on cotton from Hyderabad and Mirpurkhas to Bombay was more favourable than that between the

former two stations and Ahmedabad. It was argued that this difference could not be justified and that it was detrimental to the interests of the grower. The contention of the Railways had always been that freights on cotton were high because cotton could stand high rates but that was far from being the case at present. Reference was made to the recommendation which had been sent to the Government of India for a general reduction of railway freights but which had not been accepted on the ground that a general reduction, other than on railway traffic considerations, would be indistinguishable from a subsidy to support the cotton market. On a suggestion being made that the matter should again be investigated and a further representation made to Government, it was decided that the subject should be considered at a later date in the light of information that had now become available regarding the cost of growing cotton in India. The railway authorities asked for facts and figures and the Committee was now in a better position to supply these and take a more direct line of attack in the matter.

(8) *Enhancement of import duty on rayon yarn.*

The reply of the Government of India that the views of the Committee on the above subject had been noted was considered. The *Vice-President* observed that as the reply was not quite clear as to whether the matter was being investigated by the Government of India or not, the question should be left over for consideration at the full Committee when the President might possibly be able to give further information.

It was noted that the matter was under the consideration of the Central Government.

(9) *Division of areas into zones for growing long, medium and short staple cottons.*

Consideration was given to the suggestion that a series of comprehensive regional trials in several tracts should be conducted to determine the types of cotton most suitable for each tract and which would pay the cultivator best. It was remarked that the work done by the breeders in this connection was not sufficient to enable definite conclusions being drawn. Work on the lines suggested had been done in Russia, U.S. A. and China with very useful results. The view was expressed that though the suggestion in itself was a good one, it was obviously impossible to test all strains at all stations. Countries like Russia and China were starting at an earlier stage than India where a great deal had already been done and which was thus a long way ahead.

(10) *Hedging facilities.*

The Sub-Committee considered suggestions (1) for the widening of the Broach Futures Contract to enable all Indian American growths, both roller and saw-ginned, to be tendered against it, (2) for the widening of the Karachi 4F Contract to permit all Punjab and Sind-American types, both roller and saw-ginned, to be tendered against it, (3) for trading to be permitted in the Broach Contract in new crops 2 years ahead, and (4) for the establishment of a separate contract for staple cottons.

In support of the proposals it was urged that Punjab and Sind long staple cottons had at present no suitable hedging facilities and that they could only be tendered against the Broach Contract which, however, was subject to appreciable fluctuations. A separate contract for long staple cottons either in Bombay or Karachi, or at both places, was therefore, desirable.

In regard to the widening of the Broach Contract, it was observed that certain sections of the East India Cotton Association were opposed to the proposal, while the Association itself was of the opinion that the changes referred to would not be effective until unitary control of the futures market was secured. The Committee had already passed a resolution recommending the widening of the Broach Contract but this had not been given effect to and it was now urged that, if necessary, the Government of Bombay should be approached to move in the matter.

In support of the proposal for an alteration in the time for the commencement of trading in a new growth it was stated that the withholding of the opening of trading in a new crop was taken advantage of by the trade to the detriment of the grower.

The suggestion that saw-ginned American growths should also be made tenderable against the Broach Hedge Contract was considered to be unobjectionable, and it was thought that it would be favourably considered by the East India Cotton Association.

As regards the effect of the broadening of the Broach Contract, the view was expressed that the trade itself was not unanimous, one section favouring it on the ground that it would safeguard prices to the grower, and the other opposing it owing to the possibility of the basic price of the Contract being depressed to the disadvantage of the grower. Attention was, however, drawn to the fact that Kumpta cotton had recently been included in the Contract.

As regards the necessity of unitary control, it was urged that unless this was secured, speculative trading would move towards the Shri Mahajan Association, which was not subject to the decisions of the East India Cotton Association. In the Mahajan Association, only Broach cotton could be tendered against the Broach Contract while in the East India Cotton Association the tenderable cottons were Broach, Punjab-Americans, Kumptas and others.

The institution of a separate contract for staple cottons was not favoured in the light of the history of certain contracts in the Bombay and Liverpool markets which were hardly traded in.

Regarding the extension of the Broach Contract so as to enable trading in two new crops two years ahead, it was stated that so long as straddle business was being done, the suggestion would not help the cotton grower. After further discussion, it was decided that the matter should be placed before the full Committee for opinion.

It was decided that a special Sub-Committee should be appointed to examine this subject and to submit its report for the consideration of the full Committee at its next meeting.

(11) *Conference of the main cotton growing countries to regulate production and export.*

The general opinion of the Sub-Committee was that India should participate in the proposed World Conference on Cotton Affairs, should it materialize and that the representatives of India should be selected in consultation with the Indian Central Cotton Committee.

As decided by the Sub-Committee, full discussion on the above subject is attached.*

The Sub-Committee requested the Secretary to circulate a note explaining the purport and probable effects of the proposed export bounty on American cotton. A note has accordingly been prepared and is attached (Enclosure II).

(12) *General.*

Mr. Roger Thomas drew attention to the large losses incurred by the grower of White American seed, although work done at the Lyallpur Agricultural College had revealed that there was no appreciable difference either in the nutritive value or the oil content of such seed. He accordingly suggested that investigations should be carried out at consuming centres to discover the cause of the prejudice.

The view was expressed that any investigation in this connection should be entrusted to the marketing officers. It was decided that Mr. Roger Thomas should prepare a note on the subject, which together with a report on the work done at Lyallpur Laboratory and at Madras, should be sent to the Agricultural Marketing Officer to the Government of India for investigation and advice.

*Not printed.

ENCLOSURE I.

Import Duty on Foreign Cotton.

Secretary's Note.

This subject was first considered by the Committee in August 1932 in connection with the reply to the following question of the Textile Tariff Board :—

> " To what extent is raw cotton now imported into India of the same quality as Indian long staple cotton ? Does the present import duty on raw cotton materially help the Indian cultivator ? "

(The reply of the Committee to the above is attached—pages 102 and 103.)

Mr. Vellingiri Gounder expressed the view that owing to the import of large quantities of American cotton during the year something should be done to maintain the price of Indian long staple cotton in the interests of the ryots who were struggling to get a better price for their cotton which was the chief money crop.

Mr. Roger Thomas, in reply to a question raised by the previous speaker, observed that the object of the import duty, besides being one of revenue, was to protect staple cottons. He was in accord with all cotton growers in that he would like the duty to be more in the nature of a protective tariff.

Mr. Y. G. Deshpande was against the importation of foreign cotton and was in favour of an increase of duty to one anna per lb. of cotton as otherwise Indian cottons which could spin 60's or even 70's counts by combing would not find a ready market.

Mr. Tinker was in favour of encouraging the use of Indian cotton and of an increase in import duty.

Lala Shri Ram was of the opinion that even a duty of one anna per lb. would not give the fillip to grow quickly the whole quantity of long staple cotton required by Indian Mills.

Mr. Ramamurthy expressed the view that if the duty was restricted to cotton of $\frac{7}{8}''$ to $1''$ staple only, the tendency of the mills would be to go in for cottons of more than $1''$ staple to avoid the duty. The cotton grower of $\frac{7}{8}''$ to $1''$ staple need not, therefore, be under the wrong impression that the import duty would automatically raise the price of local long staple cotton.

Rao Saheb C. S. Shirahatti was in favour of a prohibitive duty of 3 annas per lb. with a view to preventing the dumping of American cotton of $\frac{7}{8}''$ to $1''$ staple.

In 1935, the Committee submitted to the Special Tariff Board a memorandum on the then position and future prospects of the production of long, medium and short staple cottons in India, in which it recommended that as more long staple cotton was being produced in Sind and this quantity was likely to increase to about 1 lakh bales in the near future, it might be necessary to raise from $1''$ to $1\text{-}1/16''$ the upper limit up to which Indian cottons should be given effective protection from imported foreign cottons. The considerable increase in area under Cambodias and Tinnevellies since 1930-31 may partly be attributed to the beneficial influence of the duty then in force. In other areas, where there was little scope for expansion and the actual area put to cotton depended on timely rainfall, there was a distinct tendency towards growing better varieties.

In November 1937, in connection with the fall in the prices of cotton the Local Sub-Committee considered a reference from the Bombay Government regarding the advisability of raising as one of the measures of relief to the cotton grower, the import duty on those varieties of foreign cotton which competed with Indian cotton in India. During the discussion, *Mr. Kasturbhai Lalbhai* said that imported cotton directly competing with Indian cotton was so insignificant that the raising of import duty was not likely to benefit the cotton grower. It would affect only a very small quantity of Indian cotton, but on the

other hand, it might jeopardise the export of Indian cotton to continental and other markets. The *Vice-President* (Sir Purshotamdas Thakurdas) said that America had that year grown a much larger quantity of cotton of staple 1″ and under, and it was this cotton which was competing very effectively with Indian cotton on the continent. He thought that it was necessary to protect the Indian cultivator against an influx of such cotton into India. If import duty were raised it would do no injury to the Indian cultivator, but would be a protection. The Sub-Committee finally decided that a reply should be sent to the Bombay Government to the effect that if, in the next few months, cotton prices reached parity with American, a protective duty on imported cottons of staple lengths 1″ and under, would definitely help the Indian cotton grower.

In February 1938, the Karachi Indian Merchants' Association requested the support of the Committee to their representation to the Government of India, urging them to take immediate steps to enhance the import duty on foreign cotton from six pies to one anna a pound, as a means of checking the imports of foreign cotton into India. The Local Sub-Committee in March 1938, decided that, as the bulk of the imported American cotton in 1937-38 was 1-1/16″ and above, no further action was necessary at the time.

In connection with the "policy to be adopted in regard to new schemes for propagation of long staple cotton in India," considered at the July 1938 meeting of the Committee, *Sir Purshotamdas Thakurdas* observed that there had been a consistent agitation from the Punjab and Sind, that the import of foreign cotton should be penalised and that Seth Isserdas Varindmal was in favour of penalising foreign cotton up to 1″ but not over. The Committee had been trying to grow better cottons but according to Seth Isserdas, sufficient price was not forthcoming for them in India. If American cotton under 1″ were imported, it was reasonable to suppose that Indian cotton of that staple length was not available at that price. *Mr. Chellaram Shewaram* suggested that the import duty on foreign cotton should be levied, so as to restrict mills to the use of Indian cotton for spinning 30's or more counts. *The President* read out the following figures for the import of American cotton since 1st September 1937 and said that it was fair to state that the imports of American cotton below 1⅛″ in staple were negligible :—

Staple length.	Quantity imported from 1-9-37.	Quantity contracted for but not arrived.
	Bales.	Bales.
31/32″	1,200	..
1″	500	..
1 1/16″	2,050	600
1 3/32″	6,275	250
1 1/8″	95,555	8,971
1 5/32″	33,975	200
1 3/16″	200	..
1 1/2″	10	..
Total ..	139,765	10,021

This question was again considered by the Committee in November 1938 in connection with the " Present position of Indian cotton. " *Mr. B. S. Patel* suggested consideration of the question as to whether the import of foreign cotton should be checked in order to enable the grower to get a better price for the indigenous cottons. *Sir Purshotamdas Thakurdas*, drawing attention to the figures of counts of yarn spun in Indian mills, which had gone up in recent years, said that in so far as the stopping of import of such foreign cotton as competed with Indian cottons was concerned, there was, comparatively speaking, little difference of opinion, but when it came to foreign cotton which could not be replaced by Indian cotton, and which, therefore, did not directly compete with it, the point to be consider-

ed was whether it would not mean giving a setback to the country's economy as a whole and to the productive capacity of the Indian mills to meet the Indian demand. *Sir William Roberts* suggested an increase in the import duty on cotton coming into India because the rise in imports which had taken place in recent years had accentuated the plight of the grower. The then import duty (*viz.*, 6 pies per lb.) had undoubtedly been a potent factor in increasing the area under staple cotton in the Punjab and Sind. The tax even at the then existing very low prices was only 10% of the value of a cotton like 289F. Manufacturing interest had a 50% protection, so surely, the Committee could not consider the demand unreasonable under the then serious plight of the cotton grower. *Lala Shri Ram* said, with reference to the point raised by Sir William Roberts, that the Committee should not agree to place any hindrance in the way of the textile industry, which had after great efforts been successful in meeting the requirements of the country by importing raw materials. *Mr. Chandulal P. Parikh* said that it was necessary to consider whether it would be an advantage to India if import duty on cotton were increased. He thought that no material advantage would be achieved unless there was also a prohibitive duty on imported cloth. He felt, however, that Government was not going to levy any duty on cloth, and it was this aspect of the question which required to be solved. The *Vice-President* (Sir Chunilal V. Mehta) referring to the suggestion of Sir William Roberts, said that higher duty on the import of foreign cotton or its restriction should be accompanied by restriction on the import of foreign cloth. (Sir William Roberts agreed with this view.) He realised, however, that these were subjects not within the control or competence of either the Committee or any Provincial Government, but he had no doubt that the public would very much like to know whether restriction on the import of cotton alone was going to achieve the purpose, or whether it was not necessary that it should be accompanied by restriction on the import of foreign cloth also.

Reply of the Committee.

Question (*ii*) (*a*).—To what extent is the raw cotton now imported into India of the same quality as Indian long staple cotton?

Answer.—Below will be found a statement showing the quantities and staple lengths of American, Egyptian and East African Cottons imported into India during the last 2½ years. The only cottons which can be said to compete effectively with Indians are those between ⅞″ and 1″ in length. Except for a crop of 8,000 bales of 1-1/16″ staple grown in the Punjab, India does not so far produce any cotton of greater staple than 1″. It will be seen from the table that the bulk (70 per cent.) of the American cotton imported competes with Indian styles while from Egypt and Africa is imported cotton not grown in India and therefore not competitive.

Staple lengths of imported cottons.

(From 1st September 1929 to 1st May 1932).

TABLE III.

Americans.

Staple length.	Bales.
Below 7/8″	1,000
7/8″	33,810
29/32″	53,705
15/16″	91,190
31/32″	28,038
1″	8,785
1-1/32″	11,150
1-1/16″	28,800
1-3/32″	13,085
1-1/8″	14,900
1-5/32″	200
Total	284,663

Actual Imports :—	Bales.
1929-30	12,759
1930-31	128,845
Up to 1st May 1932 ..	168,475
	310,079

TABLE IV.

Egyptians and East Africans.

Staple length.	Total number of bales.				Remarks.
	Egyptians.		East Africans.		
1″	..		2,200		
1-1/32″ ..	..		..		
1-1/16″ ..	3,875		700	*24,000	*Staple 1″ to 1-1/8″.
1-3/32″ ..	100		..		
1-1/8″	2,981		..		
1-5/32″ ..	..	†5,475		†52,167	† Staple 1-1/16″ to 1-3/16″.
1-3/16″ ..	3,740	‡8,100			‡ Staple 1-1/8″ to 1-1/4″.
1-7/32″ ..	..	§2,300			§ Staple 1-9/32″ to 1-1/2″.
1-1/4″ ..	6,968				
1-9/32″ to 1-15/32″	955	¶1,195			¶ Staple over 1-1/2″.
1-1/2″	4,997				
Total ..	40,686		79,067		

Actual Imports (in 3½ cwt. bales).

1929-30	12,387	134,533
1930-31	148,947	179,473
Up to 1st May. 1932	94,226	73,580
Total ..	255,560	387,586

N.B.—The figures of imports of foreign cotton given above have been supplied through the courtesy of importers. From 1st September 1929 to 30th April 1932, 310,079 bales of American Cotton were imported and information regarding their staple lengths has been furnished voluntarily for 92 per cent. of that quantity.

The reason for the meagre information supplied concerning Egyptian and East African cottons is that some importers have not replied to our request for information and some have not kept a record of the staple lengths of the bales imported by them.

Question (*ii*) (*b*).—Does the present import duty on raw cotton materially help the Indian cultivator ?

Answer.—The bulk of the Indian crop being short staple, there is no competition from outside sources with cotton less than ⅞″ so that the imposition of an import duty on this type of cotton can have had no effect on the majority of the Indian growers of cotton. There is also no competition in India with cottons over 1″ in staple except for the 8,000 bales of 289F of 1-1/16″ staple grown in the Punjab. We understand, however, that there may be a great future for cottons of this staple in Sind and the Punjab. For the effect of the duty on the intermediate staples between ⅞″ and 1″, there is only the experience of the past eight months to fall back on and this has been a period in which abnormal factors have predominated in the world's markets, *e.g.*, a big and high class American cotton crop being dumped on the world's markets and the general trade depression. It is, therefore, difficult to say to what extent the grower of staple cotton in India has benefited by the duty during this period but under normal conditions and circumstances an import duty on cotton should afford protection to the grower of these staples.

ENCLOSURE II.

PROPOSED EXPORT BOUNTY ON AMERICAN COTTON AND ITS POSSIBLE EFFECTS ON INDIAN COTTON.

Secretary's Note.

During disussion on the desirability of India participating in the proposed Conference of the main cotton growing countries to regulate production and export, the possibility of the U.S.A. giving an export bounty on American cotton was referred to and I was asked to prepare a note on "Export bounty on American cotton and its probable effects on Indian cotton." Information was also sought regarding the chances of Japan continuing to be a customer of Indian cotton in the future. Both these points have been examined below in the light of the information available at the moment.

I. The following extract from the "Journal of Commerce," dated 24th February 1939, received from the International Federation of Master Cotton Spinners' and Manufacturers' Associations, which gives a report of the evidence tendered by the U. S. Secretary of Agriculture, Mr. Henry A. Wallace and Mr. O. Johnston, President of the National Cotton Council, during their appearance before the Senate Agriculture Committee at its initial hearings on the Smith Cotton Bill, explains the position :—

"Predicting exports of American cotton during the current year will fall to the lowest of any period since 1882, Secretary of Agriculture Wallace to-day blamed the loss of export markets upon the effect of the loan programme in keeping prices of American cotton above world level. Appearing before the Senate Agriculture Committee at initial hearings on the Smith Cotton Bill, the Secretary also said that if anything is intended to be done by Congress along the lines proposed for liquidating the 11,000,000 bale stocks of loan cotton, it must be done within the next two weeks to be effective.

A third point made by the Secretary in his testimony was that steps are still being taken by the department and the Administration towards an international conference on the cotton situation and informal conversations have been held on the subject with several foreign officials.

Oscar Johnston, President of the National Cotton Council, former manager of the Government cotton pool, who followed the Secretary before the Committee, also emphasized the need of early aetion on the legislation and the importance that something be done to free cotton from the loan. Contrary to the estimate of the New York Cotton Exchange of 5,000,000 bales of "free cotton" in existence on January 31st last, Mr. Johnston said, a closer analysis showed only 4,580,000 bales in existence including untenderable cotton and he predicted that by August 1st there would be no free stocks of spinnable cotton left. If loan cotton was made available, he declared, the markets could easily absorb 1,000,000 bales at a price of around 8c.

Prediction of Secretary Wallace that exports of cotton this season would show another sharp drop was contained in a memorandum left with the committee on the cotton situation generally. At the end of the first half of the market season, it was stated, exports then were 57 per cent below the same period last year. Total exports for the full marketing year, ending July 31, 1939, were estimated as between 3,500,000 and 4,000,000 bales.

The memorandum said that the drop in exports was probably due to three causes :—

(1) Record stocks of foreign cotton on hand in addition to record foreign production.

(2) Smallest total consumption of cotton in foreign countries so far this season since 1935-36.

(3) An exceptionally large degree of hand-to-mouth purchases by foreign countries. This was precipitated by the unusually high spot price of American cotton relative to future contracts and relative to foreign growths.

Later in his testimony the Secretary attributed the drop to the loan programme. He said: "The loan programme has kept us during the last year especially from being in a competitive position with foreign growths." The Secretary explained that the Smith bill provides for payments to producers who keep their cotton out of the loan. This plan would result in an increased supply of cotton available for export and domestic consumption at prices lower than the present loan rate.

However, he continued, the bill authorizes no definite appropriation for carrying on the payment provisions and it is estimated that between $250,000,000 and $300,000,000 might be needed to keep the cotton from going into the loan. "If sufficient funds can be raised to make it effective," the Secretary said, "the proposal to increase payments so that cotton would be kept out of the loan in 1939 would seem desirable. This plan would allow cotton to be handled in ordinary commercial channels and, at the same time, would preserve income of cotton producers."

He urged the Committee, in closing, to accord the same treatment to other crops that is proposed to be accorded cotton. He said that this is essential to a sound farm programme.

"During Mr. Johnston's appearance before the Committee, Senator Thomas (Dem. Okla.) said that he had received reports that one of the reasons for demands that loan cotton be released was that cotton traders are unable to meet delivery because of lack of available cotton to fill their contracts."

Information contained in the following extract from the 'Financial News', Bombay, dated the 25th March 1939, is also of interest:—

"There was quite a crop of cotton news during the week under report. These news items being contradictory to each other, the market operators got immensely confounded. Thus while President Roosevelt hinted the Treasury's dislike of the Smith Bill because of its costs, an influential section in the Senate declared its opposition to the cotton export subsidy plan supposedly sponsored by the Government. While President Roosevelt announced that Government had a plan to deal with the cotton carry-over without bankrupting the Treasury, Secretary Wallace aired opposition to sweeping changes in the present Farm programme and he advocated Processing taxes for meeting the deficit caused by the removal of the surpluses. It seems fairly certain, however, that the Administration is keen on releasing some portion of the loan accumulations. It is rumoured in this connection that the 1934 loan holdings which total 1,600,000 bales may be released and exported with a subsidy of 4 cents per lb. The Government expert is reported to have recommended that Government should (*a*) take up loan stock paying the farmer a 25 point bonus: (*b*) sell the same to trade at 8.55 cents basis for middling $\frac{7}{8}$ths and (*c*) pay $1\frac{1}{4}$ cent per lb. export bonus for the current season and that of 2 cents for the new crop. The emphasis laid on loan releases caused the bulls nervously to liquidate, the New York March, 1939 contract as a result summarily collapsed by about $3 per bale on the day of its expiry and the Liverpool quotations lost 17 penny points per lb. in a single session on Saturday last. The markets being oversold, a smart recovery was staged later on, but it could not be held for long owing to the dangerous potentialities of the European political situation. Pending clarification of the issues involved, the market looks indecisive at the week end."

It is therefore quite on the cards that American cotton, supported by an export subsidy in one form or other, would compete with foreign growth. The effect of the low priced American on Indian cottons will be two-fold. First more American cotton would be purchased by Japan and other countries in place of Indian and secondly, cheap piecegoods produced from such cotton would compete with Indian piecegoods in India as well as in the foreign markets. It will, therefore be seen that in addition to the possibility of exports of Indian cotton declining, consumption of Indian cotton in Indian mills may also decline.

The extent to which this may happen, however, cannot be predicted. The lowering of the purchasing power of the cultivator and its consequent adverse effect on consumption of Indian cotton in Indian mills should not, however, be overlooked.

II. The extract from the Report of the Indian Government Trade Commissioner, Japan, dated 21st January 1939, given on page 28 of the Review of the state of foreign trade in Indian cotton for December 1938 (Subject 13) indicates the possibility of Japan, securing at least a proportion of her supplies of raw cotton in future from China.

Different views on the prospect of N. China cotton.

(*a*) The opinion is widely held that the possibility of N. China developing in the near future as a rival supplier and thereby constituting a serious menace to the position of Indian cotton in the Japanese market may be discounted. This view is based on the fact that N. China produces cotton of two types only—one variety is so poor that it can be utilised only as stuffing for quilts and is unsuitable for spinning purposes and the other is grown from American seed and is long stapled. The latter is more likely to compete with American rather than with Indian cotton.

(*b*) It is of more than passing interest to India that Japan is once more exploring every conceivable means of obtaining wool and cotton for her textile industries from Manchuria and North China. Conditions of cotton growing are thought to be better in N. China than in Manchuria where experiments have been frankly disappointing. Climatic conditions may not be very different but rather more work has already been accomplished in some directions in China than in Manchukuo. For instance, China already ranks third among the world's cotton producing nations while Manchukuo's cotton remains quite negligible despite all the efforts to encourage it. The trouble in China consisted of the coarse, uneven, and short staple unsuited, as a rule, to spinning yarns finer than 16's or 20's. The Nanking Governments' Economic Council, however, set its hand to the problem some four or five years ago and there has been a steady achievement which promises in another three years or so to revolutionise the industry in China. By October 1935, the Bureau of Cotton Cultivation had planted improved American seeds on over seven million acres of land in Kiangsu, Honan, Shensi and Hopie, seeds which were not only superior in quality but which made possible a higher yield. Simultaneously, there has been a general study of cotton cultivation specially the control of pests and the method of plantation, the suitability of various fertilisers and an interesting experiment in newly-reclaimed salt regions. A special department of the Bureau at one time had no fewer than 3,700 investigators at work collecting data in 1000 centres spread over 14 provinces. (Capital, Calcutta, dated 3rd March 1938.)

(*c*) The idea has long obtained here (in Japan) that Chinese cotton is coarse and short and consequently unfit for general spinning purposes and suitable only for very coarse yarns, absorbent cotton and the padding for clothes and bedding. This generalisation applies, however, only to the Chinese cotton which has long been grown in the Southern provinces. The species grown in N. China have a longer and finer fibre which makes them suitable materials for modern spinning mill uses.

As N. China has a considerable area—far more than South China—available for cotton cultivation, its importance as a supply source can be enhanced if cultivation is properly guided and encouraged. In recent years the cotton acreage has been increasing, thanks to encouragement given by the Government authorities of China as well as by the Japanese industrialists. On the basis of past experience, it is claimed that under more favourable circumtances and with proper encouragement the acreage can be increased sufficiently to double the production and raise the volume available for export to twenty times the present figure. If this goal is attained N. China will supply Japan between 6 and 7 million piculs (354,000 and 413,000 tons) of cotton, a quantity corresponding to the annual tonnage which Japan is now importing from British India. Such a development would solve half of Japan's raw cotton problem at a single stroke.

In this connection the fear has been expressed that a large scale expansion of cotton production in N. China might create the problem of food stuff shortage among the population there, due to a considerable shifting of the grain and cereal acreage to cotton. However, most cotton technical experts, now in the region, agree that this problem is not likely to develop if the increase in cotton production does not exceed a volume equivalent to that which British India is now supplying to Japan. It thus appears that within the next few years Japan will adopt an entirely different policy in obtaining her raw cotton supply. (Oriental Economist, Japan, January 1938 issue).

Cotton production in Chosen.

(From I. C. B., January 1938).

The first estimate of the 1937 cotton crop in Chosen is placed at 216,000 bales of 478 lbs. according to a report received. The acreage this year is estimated at 545,000 acres which is only 3 per cent below the 1936 record. The estimated production of 216,000 bales greatly exceeds that of last season which was only 119,000 bales. The large increase this season is attributed to the very favourable weather condition and the marked increase in production of Upland or improved cotton.

It has been reported that the Chosen Government authorities will endeavour to increase the area devoted to cotton to about 1,000,000 acres by 1942 from which it is hoped to obtain approximately 600,000 bales.

(U. S. Department of Agriculture.)

Cotton production in Manchukuo.

(From I. C. B., January 1938).

Mukden cables stated that the Manchurian crop is estimated at 84,205 bales of 478 lbs. equivalent weight, comparing with 65,900 last year and 38,740 two years ago. The record crop in Manchuria was 86,471 raised in 1934.

(New York Cotton Exchange Service.)

The ten years plan in Formosa aims at an ultimate acreage of 120,000 with a yield per acre of 1,100 lbs. of (unginned) cotton.

The figures for exports of Indian cotton from British India to Japan during the last three years given on page 4 of the Review for December 1938, however, indicate that Japan has increased her purchases of Indian cotton in recent months. The export up to January for the current season is considerably above the corresponding figure of last year, though far behind the record takings of the year before. The problem, however, is so complicated and the material available so conflicting that it is not possible to hazard any definite view regarding the future takings of Indian cotton by Japan.

APPENDIX IV.

Revised Trade Classification of Indian Cottons.

Trade Descriptions.	Tracts included.
I. BENGALS.—	
(1) U.P. Deshi ..	United Provinces (including Rampur State), Delhi, Bihar, Orissa [excluding the districts of (*i*) Koraput and (*ii*) Ganjam (other than the Khondmals)], Bundelkhand Agency of Central India, Rewa State of Central India Residency (Indore), and Western Bengal (Bankura and Midnapore districts).
(2) Punjab Deshi ..	Punjab (including Indian States except Khairpur State) and North-West Frontier Province.)
(3) Sind Deshi ..	Sind (including Khairpur State).
(4) Rajputana Deshi. ..	Ajmer-Merwara and Rajputana States (excluding Jhalawar and Partabgarh States and Sironj, Chhabra and Pirawa parganas of Tonk State).
II. AMERICANS.—	
(1) Sind-American	Sind (including Khairpur State).
(2) Punjab-American.	Punjab (including Indian States except Khairpur State).
(3) Buri	Burhanpur *tahsil* of Nimar district of Central Provinces.
III. OOMRAS.—	
(1) C. P. Oomras ..	Central Provinces (excluding Nimar district); and Yeotmal district of Berar.
(2) Berar Oomras	Berar (excluding Yeotmal district).
(3) Nimar Oomras	Nimar district of Central Provinces.
(4) C. P. and Berar Verum.	Central Provinces and Berar.
(5) Khandesh Oomras. ..	Nasik, East Khandesh (excluding Amalner taluka) and West Khandesh (excluding Nawapur and Shirpur talukas) districts of Bombay Province.
(6) Khandesh Banilla. ..	Amalner taluka of East Khandesh district and Shirpur taluka of West Khandesh district of Bombay Province.
(7) Barsi-Nagar Oomras. ..	Ahmednagar, Poona and Sholapur districts of Bombay Province and Akalkot State.
(8) Hyderabad Oomras. ..	Aurangabad, Bir (excluding Mominabad taluka), Parbhani, Adilabad (excluding Nirmal taluka), Osmanabad (excluding the protected tract included under "Hyderabad-Gaorani") and Nizamabad districts of Hyderabad State.

Trade Descriptions.	Tracts included.
IV. HYDERABAD GAORANI	The Hyderabad-Gaorani Protected area of Hyderabad State comprising : the districts of Nander and Bidar, part of Osmanabad districts, Nirmal taluka of Adilabad district and Mominabad taluka of Bir district.
V. CENTRAL INDIA.—	
(1) Malvi ..	Gwalior State, Indore State, Bhopal Agency and Malwa Agency of Central India ; Jhalawar and Partabgarh States and Sironj, Chhabra and Pirawa parganas of Tonk State of Rajputana.
(2) Central India —others.	
VI. BROACH	.. Kaira district and Broach and Panch Mahals district (excluding Ankleshwar taluka) of Bombay Province, States in Rewa Kantha Agency (excluding Rajpipla State), Cambay State and Baroda district of Baroda State.
VII. SURTI	.. Ankleshwar taluka of Broach and Panch Mahals district, Surat district and Nawapur taluka of West Khandesh district of Bombay Province, Rajpipla State of Rewa Kantha Agency, Surat States and Navsari district of Baroda State.
VIII. DHOLLERAS.—	
(1) Gujerat— Dholleras.	.. " Wagad," " Lalio " and other staple cottons grown in Ahmedabad district of Bombay Province, Mehsana district of Baroda State and in part of Western India States Agency.
(2) Gujerat— Short-Staple	.. Short-staple cottons grown in part of Western India States Agency.
(3) Kathiawar— Dholleras.	.. " Wagad," " Kala " and other staple cottons grown in part of Western India States Agency.
(4) Kathiawar— Short-Staple.	.. " Mathia " and other short-staple cottons grown in part of Western India States Agency and in Amreli district of Baroda State.
(5) Cutch .. Dholleras.	.. Cutch State.
IX. SOUTHERNS.—	
(1) Kumpta and Upland.	.. Dharwar, Belgaum and Satara districts of Bombay Province ; Satara Jagirs ; S. M. C. States ; Mysore State (excluding Mysore and Bangalore districts) ; and Raichur Protected Area in Raichur district of Hyderabad State.
(2) Bijapur and Bagalkot Jowari.	.. Bijapur district of Bombay Province.
(3) Westerns	.. Bellary, Anantapur and Cuddapah districts and Pattikonda taluka of Kurnool district of Madras Province ; Raichur district (excluding the Raichur Protected Area) and Gulbarga district of Hyderabad State.

Trade Descriptions.		Tracts included.
IX.—SOUTHERNS—(*contd.*)		
	(4) White and Red Northerns.	Kurnool district (excluding Pattikonda taluka but including Banganapalle State) of Madras Province.
	(5) Warangal and Cocanadas.	Nellore, Guntur, Kistna, East Godavari and West Godavari districts and Golgonda taluka of Vizagapatam district of Madras Province; Warangal, Karimnagar, Nalgonda, Mahboobnagar, Atrafibalda and Medak districts of Hyderabad State.
	(6) Chinnapathi (Short-Staple).	.. Ganjam (excluding the Khondmals) and Koraput districts of Orissa; and Vizagapatam (excluding Golgonda taluka) district of Madras Province.
X.	TINNEVELLIES.— (including Karungannies.)	Coimbatore, Madura, Ramnad and Tinnevelly districts of Madras Province.
XI.	CAMBODIAS ..	.. North Arcot, South Arcot, Coimbatore, Salem, Trichinopoly (including Pudukkottai State), Madura, Ramnad, Tinnevelly, Chittoor and Chingleput districts of Madras Province.
XII.	SALEMS ..	.. South Arcot, Coimbatore, Salem, Trichinopoly, Tanjore, Malabar and South Kanara districts of Madras Province; and Mysore district of Mysore State.
XIII.	COMILLAS ..	.. Assam; and Eastern Bengal (Mymensingh and Chittagong Hill Tracts districts and Tripura State).

APPENDIX V.

INDIAN RAW COTTON CONSUMED IN INDIAN MILLS.

(Based on returns made under the Indian Cotton Cess Act, 1923, by mills in British India, and on voluntary returns from mills in Indian States).

Cotton Year : 1st September to 31st August.

(In Bales of 400 lbs. nett.)

——	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	†1936-37.	1937-38.	1938-39.
Bombay Island ..	987,355	731,937	747,988	435,426	542,036	766,375	664,546	611,606	565,084	491,709	687,287	664,199	636,720	782,815	750,317
Ahmedabad	273,639	286,800	264 139	298,075	318,983	344,021	321,502	322,257	348,009	373,345	326,558	320,982	304,398	346,269	346,375
Bombay Province ..	1,424,447	1,189,539	1,167,892	894,671	1,044,925	1,300,859	1,173,659	1,132,645	1,116,297	1,063,549	1,230,616	1,189,310	1,128,744	1,353,998	1,316,313
Madras Province ..	162,876	176,274	185,207	194,591	204,284	211,488	214,759	260,707	292,013	278,060	312,164	365,423	410,779	417,602	471,129
United Provinces ..	177,064	191,740	204,702	170,846	182,462	234,205	235,623	256,820	273,573	277,230	292,424	317,011	299,073	288,320	356,331
Central Provinces and Berar	106,052	109,995	111,292	116,888	121,391	123,146	118,492	115,018	111,208	112,660	125,014	130,298	122,987	146,587	164,616
Bengal..	83,553	77,949	89,763	82,086	84,212	99,075	91,993	102,390	103,784	107,633	101,101	98,892	79,944	92,036	85,361
The Punjab and Delhi	30,663	35,394	40,687	45,638	54,575	64,464	73,736	89,681	80,854	71,939	83,897	89,430	93,886	94,742	119,792
Rest of British India	14,414	17,313	13,190	15,040	22 189	24,458	27,101	30,342	31,935	35,139	38,575	38,010	35,823	46,840	49,806
Total—British India	1,999,069	1,798,204	1,812,733	1,519,760	1,714,038	2,057,695	1,935,363	1,987,603	2,009,664	1,946,210	2,183,791	2,228,374	2,171,236	2,440,125	2,563,348
Total—Indian States*	175,609	187,614	229,443	251,589	277,540	315,399	333,996	358,793	351,260	390,116	428,341	449,314	460,060	554,003	557,739
TOTAL—INDIA ..	2,174,678	1,985,818	2,042,176	1,771,349	1,991,578	2,373,094	2,269,359	2,346,396	2,360,924	2,336,326	2,612,132	2,677,688	2,631,296	2,994,128	3,121,087

* Figures for Indian States up to and including 1930-31, being based on yarn production returns, include foreign cotton also.
† From April 1937 figures for Burma have been excluded.

INDIAN RAW COTTON CONSUMED IN MILLS IN INDIAN STATES.

(Based on voluntary returns from mills in Indian States).

N.B.—Figures up to and including 1930-31, being based on yarn production, include foreign cotton also.

Cotton Year : 1st September to 31st August.

(In Bales of 400 lbs. nett.)

—	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.	1937-38.	1938-39.
Hyderabad	15,210	16,697	19,067	20,823	23,074	31,290	33,488	33,231	45,588	51,771	49,981	63,093	68,156
Mysore	43,571	44,320	39,619	46,500	43,326	49,293	50,596	47,168	51,196	50,824	53,236	55,244	52,628
Baroda	46,070	46,884	48,852	59,043	62,578	58,534	50,587	53,612	57,146	51,963	51,761	70,686	73,278
Gwalior	24,257	25,716	36,708	41,463	45,207	45,892	43,306	49,362	56,318	72,163	79,079	89,243	94,090
Indore	53,526	65,391	76,070	83,026	88,620	95,296	91,036	111,430	114,229	113,379	106,454	147,766	140,792
Kathiawar States	} 46,809	52,581	57,224	64,454	{ 20,283	18,849	18,868	26,506	35,438	37,397	42,717	48,545	43,906
Other Indian States					32,558	39,382	40,209	45,197	45,735	51,462	57,767	57,119	58,414
Pondicherry					18,350	20,257	23,170	23,610	22,691	20,355	19,065	22,307	26,475
Total—Indian States ..	229,443	251,589	277,540	315,399	333,996	358,793	351,260	390,116	428,341	449,314	460,060	554,003	557,739

LOOSE (UNPRESSED) INDIAN RAW COTTON RECEIVED IN SPINNING MILLS IN BRITISH INDIA.

(Based on voluntary returns furnished by mills.)

Cotton Year : 1st September to 31st August.

(In Bales of 400 lbs. nett.)

—	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	‡1936-37.	1937-38.	1938-39.
Bombay Province	28,328	24,970	27,324	24,361	54,409	74,979	80,092	74,868	58,355	75,617	67,219	74,750	80,164
Madras Province	35,198	39,560	52,188	46,582	55,717	99,389	96,340	110,875	123,260	147,044	173,102	156,675	158,239
United Provinces	16,991	10,308	13,878	20,441	18,496	14,367	19,236	17,871	10,090	10,405	10,659	15,719	17,532
Central Provinces and Berar..	40,762	20,861	6,924	16,243	15,771	20,743	17,462	18,382	20,544	27,502	26,321	32,860	26,980
Bengal*	..	..	..	..	..	..	..	..	..	..	90	..	..
The Punjab and Delhi† ..	3,910	4,739	3,760	4,361	4,307	2,317	2,149	..	5,535	3,110	28,385	23,873	23,076
Rest of British India* ..	..	..	..	..	..	..	..	..	..	..	19,282	17,160	22,916
Total—British India..	125,189	100,438	104,074	111,988	148,700	211,795	215,279	221,996	217,784	263,678	325,058	321,037	328,907
Indian States*	..	..	..	..	..	..	..	..	..	..	131,149	109,003	120,718
Total—INDIA* ..	..	..	..	..	..	..	..	..	..	..	456,207	430,040	449,625

* Figures up to 1935-36 not compiled. † Figures up to 1935-36 exclude Delhi.

‡ From 1936-37 the figures refer to consumption and not receipts and are based on returns furnished under the Indian Cotton Cess Act, 1923, by mills in British India and on voluntary returns from mills in Indian States. From April 1937 figures for Burma have been excluded.

APPENDIX VI.

STOCKS OF INDIAN RAW COTTON HELD IN INDIA BY THE MILLS AND THE TRADE ON 31st AUGUST 1938 AND 1939.

(In thousand bales * of 400 lbs. each.)

Trade Descriptions of Cotton.	Trade Stocks on 31st August.								Mill Stocks on 31st August.		Total Trade and Mill Stocks on 31st August.	
	Bombay Island.		Karachi.		Rest of India.		Total India.		Total India.			
	1938.	1939.	1938.	1939.	1938.	1939.	1938.	1939.	1938.	1939.	1938.	1939.
BENGALS—												
U. P. *Deshi*	..	..	..	..	..	(*a*) 12	..	12	38	34	38	46
Punjab *Deshi*	..	..	83	51	(*b*) 24	(*b*) 3	107	54	60	24	167	78
Sind *Deshi*	..	..	26	6	..	..	26	6	4	1	30	7
Rajputana *Deshi*	..	..	..	..	..	..	..	..	16	14	16	14
Unclassified	26	29	1	4	(*c*) 1	..	28	33	4	5	32	38
Total	26	29	110	61	25	15	161	105	122	78	283	183
AMERICANS—												
Punjab—289-F	11	26	8	7	(*b*) 1	(*b*) 1	21	36	71	66	121	123
Punjab L.S.S.	..	..	..	1	(*b*) 1	(*b*) 1			29	21		
Punjab (Unspecified—4F)	5	4	59	14	(*b*) 10	(*b*) 8	74	26	193	166	267	192
Sind Sudhar (289-F-1)	20	24	6	3	..	..	26	27	15	19	41	46
Sind (Unspecified & 4F-98)	7	3	16	13	(*d*) 1	(*d*) 1	24	17	30	23	54	40
Dharwar (Gadag 1)	..	..	..	..	..	(*e*) 7	..	7	9	5	9	12
Dharwar (Upland—Unspecified)	..	..	..	..	(*e*) 8†	..	8	..	9	6	17	6
Cambodia (Coimbatore No. 2)	..	..	..	..	..	..	..	..	72	46	72	46
Cambodia (Unspecified)	3	1	..	..	(*f*) 55	(*f*) 31	58	32	24	15	82	47
Total	46	58	89	38	76	49	211	145	452	367	663	512
OOMRAS—												
C. P. & Nimar Oomras	26	8	..	..	(*g*) 9‡‡	(*g*) 6	35	14	59	13	94	27
Berar Oomras	27	14	..	..	(*h*) 32	(*h*) 16	59	30	34	26	93	56
C. P. and Berar Verum	..	..	..	..	..	..	..	..	10	13	10	13
Khandesh Oomras	41	17	..	..	(*i*) 3	(*i*) 4	44	21	17	15	61	36
Khandesh-Banilla	..	..	..	..	..	..	..	..	7	16	7	16
Barsi-Nagar Oomras	33	14	..	..	(*j*) 107	(*j*) 46	140	60	16	9	156	69
Hyderabad Oomras												
Total	127	53	..	..	151	72	278	125	143	92	421	217
HYDERABAD GAORANI	..	..	..	..	(*j*) 19	(*j*) 18	19	18	82	42	101	60
CENTRAL INDIA—												
Malvi	..	..	..	..	(*k*) 2	(*k*) 2	2	2	29	25	31	27
Central India—Others	19	11	..	..	(*l*) 46§	(*l*) 34	65	45	20	12	85	57
Total	19	11	..	..	48	36	67	47	49	37	116	84
BROACH	96	45	..	..	(*c*) 4	(*c*) 7	100	52	89	43	189	95
SURTI	6	42	..	..	..	..	6	42	53	58	59	100
DHOLLERAS—												
Gujarat-Dholleras	48	52	..	..	(*d*) 18@	(*c*) 9 ¶	66	61	46	41	112	102
Gujarat-Short Staple												
Kathiawar-Dholleras												
Kathiawar-Short Staple	24	4	..	..	..	..	24	4	7	4	31	8
Cutch-Dholleras	..	..	..	..	..	..	..	..	..	1	..	1
Total	72	56	..	..	18	9	90	65	53	46	143	111
SOUTHERNS—												
Kumptas (Jayawant)	..	..	..	..	(*m*) 1	(*m*) 8 *o*	1	8	26	36	27	44
Kumptas (Unspecified)	18	37	..	..	(*e*) 5**	(*n*) 1	23	38	46	30	69	68
Bijapur and Bagalkot Jowari												
Westerns	12	41	..	..	(*f*) 39‖	(*j*) 60 *p*	51	101	81	97	132	198
White and Red Northerns												
Warangal and Cocanadas	..	..	..	..	(*f*) 33‡	(*f*) 14	33	14	7	10	40	24
Total	30	78	..	..	78	83	108	161	160	173	268	334
TINNEVELLIES (including Karungannies)—												
Tinnevellies	1	..	..	..	(*f*) 37	(*f*) 26	38	26	45	25	83	51
Karungannies	..	..	..	..	..	..	..	..	27	20	27	20
Total	1	..	..	..	37	26	38	26	72	45	110	71
SALEMS	..	..	..	..	(*f*) 12	(*f*) 9	12	9	6	1	18	10
COMILLAS	1	..	..	..	..	..	1	..	..	..	1	..
UNCLASSIFIED	9	3	..	..	(*c*) 8	(*c*) 5	17	8	4	4	21	12
Total Indian Cotton	433	375	199	99	476	329	1,108	803	1,285	986	2,393	1,789

* Standard Indian bales of approximate average gross weight 400 lbs. and net weight 392 lbs. of cleaned (lint) cotton.

N.B.—The detailed statement of mill stocks on 31st August 1939 is attached.

(*a*) At Cawnpore.
(*b*) In the Punjab.
(*c*) In Baroda State.
(*d*) At Ahmedabad.
(*e*) At Gadag.
(*f*) In Madras Province.
(*g*) In Central Provinces.
(*h*) In Berar.
(*i*) In East & West Khandesh districts.
(*j*) In Hyderabad State.
(*k*) In Indore State.
(*l*) In Indore & Gwalior States.
(*m*) At Hubli.
(*n*) In Mysore State.
† Includes 475 bales at Hubli.
‡‡ „ 965 „ at Ahmedabad.
@ „ 7,000 bales in Baroda State.
** „ 2,000 „ at Hubli and 927 bales at Bailhongal.
‖ Includes 20,000 bales in Hyderabad State.
‡ „ 15,000 „ „ „
¶ „ 3,812 „ at Ahmedabad.
o „ 3,500 „ Gadag.
p „ 11,000 bales in Madras Province & 8,000 bales in Bijapur.
§ „ 6,000 „ in Baroda State.

STOCKS OF RAW COTTON HELD BY THE MILLS

(Compiled from voluntary returns

(In thousand bales*

Trade Descriptions of Cotton.	Bombay Island.	Ahmedabad.	Rest of Bombay Province.	Total Bombay Province.	Madras North.	Madras South.	Total Madras Province.	United Provinces.	Central Provinces.	Berar.	Total C. P. and Berar.	Bengal.	Punjab and Delhi.
BENGALS—													
U. P. *Deshi*	1	..	..	1	..	..	..	30	..	..	..	1	1
Punjab *Deshi*	4	..	..	4	..	..	..	5	..	..	..	1	8
Sind *Deshi*	..	1	..	1	..	..	..	..	..	..	..	..	..
Rajputana *Deshi*	1	..	..	1	..	..	..	..	..	..	..	..	..
Unclassified	2	..	..	2	..	..	..	1	..	..	..	..	..
Total	8	1	..	9	..	..	..	36	..	..	..	2	9
AMERICANS—													
Punjab—289-F	19	1	..	20	2	14	16	19	1	..	1	4	2
Punjab L.S.S.	4	..	..	4	..	5	5	2	3	..	3	2	4
Punjab (Unspecified—4F)	22	1	1	24	..	16	16	86	..	..	..	10	21
Sind Sudhar (289 F-1)	14	1	..	15	..	3	3	..	..	..	..	..	..
Sind (Unspecified & 4F-98)	3	1	1	5	1	13	14	..	..	..	..	..	..
Dharwar (Gadag 1)	2	..	3	5	..	..	..	..	..	..	..	..	..
Dharwar (Upland-Unspecified)	1	..	2	3	2	..	2	..	..	..	..	..	..
Cambodia (Coimbatore No. 2)	..	..	..	..	..	43	43	..	..	..	..	..	..
Cambodia (Unspecified)	..	..	..	..	..	11	11	..	1	1	2	..	..
Total	65	4	7	76	5	105	110	107	5	1	6	16	27
OOMRAS—													
C. P. and Nimar Oomras	..	..	1	1	..	..	..	..	8	1	9	1	..
Berar Oomras	1	..	3	4	..	..	..	..	17	4	21	..	..
C. P. and Berar Verum	1	..	..	1	..	..	..	..	6	1	7	..	..
Khandesh Oomras	4	..	11	15	..	..	..	..	..	..	..	..	..
Khandesh-Banilla	..	..	11	11	..	..	..	..	4	..	4	..	..
Barsi-Nagar Oomras / Hyderabad Oomras	1	..	7	8	..	..	..	..	..	..	..	..	..
Total	7	..	33	40	..	..	..	..	35	6	41	1	..
HYDERABAD GAORANI	1	..	14	15	..	..	..	..	5	1	6	..	..
CENTRAL INDIA—													
Malvi	3	..	..	3	..	..	..	4	..	..	..	..	..
Central India—Others	3	1	..	4	..	..	..	2	..	..	..	..	..
Total	6	1	..	7	..	..	..	6	..	..	..	..	..
BROACH	17	16	..	33	..	2	2	..	..	..	..	1	..
SURTI	25	22	3	50	..	..	..	..	1	..	1	..	..
DHOLLERAS—													
Gujarat-Dholleras / Gujarat-Short Staple / Kathiawar-Dholleras	7	22	1	30	..	..	..	..	..	..	..	..	..
Kathiawar-Short Staple	4	..	..	4	..	..	..	..	..	..	..	..	..
Cutch-Dholleras	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	11	22	1	34	..	..	..	..	..	..	..	..	..
SOUTHERNS—													
Kumptas (Jayawant)	14	..	2	16	7	..	7	..	1	..	1	..	..
Kumptas (Unspecified)	13	1	11	25	..	1	1	..	..	..	..	..	..
Bijapur and Bagalkot Jowari / Westerns	13	4	25	42	12	4	16	1	..	..	..	..	..
White and Red Northerns	1	..	..	1	8	..	8	..	..	..	..	1	..
Warangal and Cocanadas	..	..	..	..	3	1	4	..	..	..	..	1	..
Total	41	5	38	84	30	6	36	1	1	..	1	2	..
TINNEVELLIES (including Karungannies)													
Tinnevellies	1	..	..	1	..	24	24	..	..	..	..	..	..
Karungannies	..	..	..	..	..	20	20	..	..	..	..	..	..
Total	1	..	..	1	..	44	44	..	..	..	..	..	..
SALEMS	..	..	..	..	..	1	1	..	..	..	..	..	..
COMILLAS	..	..	..	..	..	..	..	..	..	..	..	..	..
UNCLASSIFIED	..	..	..	..	..	1	1	..	..	..	..	..	..
Total Indian Cotton	182	71	96	349	35	159	194	150	47	8	55	22	36
AMERICANS	30	..	..	30	..	1	1	..	..	..	..	1	..
EGYPTIANS	7	11	1	19	2	2	4	..	..	..	..	..	1
EAST AFRICANS	15	15	2	32	..	3	3	..	1	..	1	2	..
OTHERS (Sudan, Burma, etc.)	16	4	1	21	..	2	2	..	1	..	1	..	..
Total Foreign Cotton	68	30	4	102	2	8	10	..	2	..	2	3	1
GRAND TOTAL	250	101	100	451	37	167	204	150	49	8	57	25	37

* Standard Indian bales of approximate average gross weight 400

IN INDIA ON 31st AUGUST 1939.

furnished by mills.)

of 400 lbs. each.)

Rest of British India.	Total British India.	Hyderabad.	Mysore.	Baroda.	Gwalior.	Indore.	Kathiawar States.	Other Indian States.	Pondicherry.	Total Indian States.	GRAND TOTAL.	Trade Descriptions of Cotton.
												BENGALS—
..	33	..	..	..	..	..	..	1	..	1	34	U. P. *Deshi*
5	23	..	..	..	1	..	..	..	..	1	24	Punjab *Deshi*
..	1	..	..	..	..	..	..	..	..	..	1	Sind *Deshi*
11	12	..	..	..	..	1	..	1	..	2	14	Rajputana *Deshi*
2	5	..	..	..	..	..	..	..	..	..	5	Unclassified
18	74	..	..	..	1	1	..	2	..	4	78	Total
												AMERICANS—
1	63	..	1	..	..	..	..	1	1	3	66	Punjab—289-F
..	20	..	..	..	..	1	..	..	..	1	21	Punjab L. S. S.
6	163	..	..	..	..	..	..	..	2	3	166	Punjab (Unspecified—4F)
..	18	..	..	..	..	..	..	..	1	1	19	Sind Sudhar (289 F-1)
..	19	..	..	..	..	..	..	2	2	4	23	Sind (Unspecified & 4F-98)
..	5	..	..	..	..	..	..	..	..	..	5	Dharwar (Gadag 1)
..	5	..	1	..	..	..	..	..	..	1	6	Dharwar (Upland-Unspecified)
..	43	..	1	..	..	..	..	2	..	3	46	Cambodia (Coimbatore No. 2)
..	13	..	2	..	..	..	..	..	..	2	15	Cambodia (Unspecified)
7	349	..	5	..	..	1	..	6	6	18	367	Total
												OOMRAS.—
..	11	..	..	..	..	..	..	2	..	2	13	C. P. and Nimar Oomras
..	25	..	..	..	..	..	..	1	..	1	26	Berar Oomras
..	8	4	..	..	..	1	..	..	..	5	13	C. P. and Berar Verum
..	15	..	..	..	..	..	..	..	..	..	15	Khandesh Oomras
..	15	..	..	..	1	..	..	..	..	1	16	Khandesh-Banilla
..	8	1	..	..	..	..	..	..	..	1	9	Barsi-Nagar Oomras / Hyderabad Oomras
..	82	5	..	..	1	1	..	3	..	10	92	Total
..	21	21	..	..	..	..	..	..	..	21	42	HYDERABAD GAORANI
												CENTRAL INDIA—
..	7	..	..	2	8	5	..	3	..	18	25	Malvi
..	6	..	..	..	1	4	..	1	..	6	12	Central India —Others
..	13	..	..	2	9	9	..	4	..	24	37	Total
1	37	..	..	5	..	..	1	..	..	6	43	BROACH
..	51	..	..	3	1	..	2	1	..	7	58	SURTI
												DHOLLERAS—
..	30	..	..	4	..	..	7	..	..	11	41	Gujarat-Dholleras / Gujarat-Short Staple / Kathiawar-Dholleras
..	4	..	..	..	..	..	..	..	..	..	4	Kathiawar-Short Staple
..	..	..	..	..	..	..	1	..	..	1	1	Cutch-Dholleras
..	34	..	..	4	..	..	8	..	..	12	46	Total
												SOUTHERNS—
..	24	..	5	..	..	1	..	6	..	12	36	Kumptas (Jayawant)
..	26	..	4	..	..	..	..	..	..	4	30	Kumptas (Unspecified)
..	59	2	18	..	..	..	..	1	1	22	81	Bijapur and Bagalkot Jowari / Westerns
..	10	..	5	..	..	..	..	..	1	6	16	White and Red Northerns
..	5	5	..	..	..	..	..	..	..	5	10	Warangal and Cocanadas
..	124	7	32	..	..	1	..	7	2	49	173	Total
												TINNEVELLIES (including Karungannies)
..	25	..	..	..	..	..	..	..	..	..	25	Tinnevellies
..	20	..	..	..	..	..	..	..	..	..	20	Karungannies
..	45	..	..	..	..	..	..	..	..	..	45	Total
..	1	..	..	..	..	..	..	..	..	..	1	SALEMS
..	..	..	..	..	..	..	..	..	..	..	..	COMILLAS
..	1	..	3	..	..	..	..	..	..	3	4	UNCLASSIFIED
26	832	33	40	14	12	13	11	23	8	154	986	Total Indian Cotton
..	32	..	..	..	..	..	..	..	..	..	32	AMERICANS
..	24	..	1	1	..	..	..	..	..	2	26	EGYPTIANS
..	38	..	1	3	..	..	1	1	..	6	44	EAST AFRICANS
..	24	..	..	..	..	..	..	..	..	..	24	OTHERS (Sudan, Burma, etc.)
..	118	..	2	4	..	..	1	1	..	8	126	Total Foreign Cotton
26	950	33	42	18	12	13	12	24	8	162	1,112	GRAND TOTAL

lbs. and net weight 392 lbs. of cleaned (lint) cotton.

STOCKS OF INDIAN COTTON ON 31st JANUARY HELD BY THE MILLS AND THE TRADE IN THE MADRAS PROVINCE.

(In Thousand bales of 400 lbs. each.)

Trade Descriptions of Cotton.	Mill stocks on 31st January.					Trade Stocks on 31st January.					Total stocks on 31st January.				
	1935.	1936.	1937.	1938.	1939.	1935.	1936.	1937.	1938.	1939.	1935.	1936.	1937.	1938.	1939.
Tinnevellies	21	14	28	22	32	7	12	4	18	4	28	26	32	40	36
Salems	10	6	8	15	16	2	3	2	3	8	12	9	10	18	24
Cambodias	42	41	47	46	71	11	22	11	14	17	53	63	58	60	88
Northerns & Westerns	14	14	22	24	19	(a)	(a)	11	12	18	14	14	33	36	37
Cocanadas	†	†	†	†	1	(a)	(a)	10	12	14	..	..	10	12	15
Outside Cottons ..	41	28	34	50	27	(a)	(a)	..	..	..	41	28	34	50	27
Total	128	103	139	157	166	20	37	38	59	61	148	140	177	216	227

(a) Figures not collected. † Less than 500 bales.

APPENDIX VII.

EXPORTS BY SEA OF INDIAN RAW COTTON CLASSIFIED BY VARIETIES.

(Compiled from voluntary returns furnished by exporters.)

1st September 1938 to 31st August 1939.

(In thousand bales of 400 lbs. each.)*

Trade Descriptions of Cotton.	Exported to				Total Exports.
	Europe (excluding United Kingdom) and the West.	United Kingdom.	Japan.	China and the East (excluding Japan).	
BENGALS—					
U. P. *Deshi*	4	1	10	1	16
Punjab *Deshi*	203	75	148	47	473
Sind *Deshi*	105	33	4	4	146
Rajputana *Deshi*	5	—	10	5	20
Unclassified	1	1	1	—	3
Total ..	318	110	173	57	658
AMERICANS—					
Punjab—289-F	9	14	5	27	55
Punjab L.S.S.	3	2	2	25	32
Punjab (Unspecified—4-F)	69	144	114	185	512
Sind Sudhar—(289-F-1)	11	2	12	31	56
Sind (Unspecified and 4-F-98) ..	8	19	9	33	69
Dharwar (Gadag 1)	—	1	—	—	1
Dharwar (Upland-Unspecified) ..	—	—	5	5	10
Cambodia (Coimbatore No. 2) ..	—	—	1	—	1
Cambodia (Unspecified)	—	—	—	—	—
Total ..	100	182	148	306	736
OOMRAS—					
C. P. and Nimar Oomras	25	18	53	21	117
Berar Oomras	34	12	177	59	282
C. P. and Berar Verum	—	—	—	—	—
Khandesh Oomras	24	2	146	34	206
Khandesh—Banilla	2	—	25	5	32
Barsi-Nagar Oomras	11	3	71	16	101
Hyderabad Oomras					
Total ..	96	35	472	135	738
HYDERABAD GAORANI	—	—	1	—	1
CENTRAL INDIA—					
Malvi	6	—	45	26	77
Central India—Others	22	—	74	22	118
Total ..	28	—	119	48	195
BROACH	49	32	49	110	240
SURTI	3	—	5	7	15
DHOLLERAS—					
Gujarat—Dholleras	2	4	71	50	127
Gujarat—Short staple					
Kathiawar—Dholleras	79	—	31	4	114
Kathiawar—Short staple	2	—	6	—	8
Cutch—Dholleras					
Total ..	83	4	168	54	249
SOUTHERNS—					
Kumptas (Jayawant)	—	—	—	—	—
Kumptas (Unspecified)	1	1	—	—	2
Bijapur and Bagalkot Jowari Westerns	26	1	71	40	138
White and Red Northerns	9	—	16	9	34
Warangal and Coconadas ..	8	20	—	5	33
Total ..	44	22	87	54	207
TINNEVELLIES(including Karungannies)					
Tinnevellies	2	3	3	—	8
Karungannies	1	—	—	8	9
Total ..	3	3	3	8	17
SALEMS	2	—	—	—	2
COMILLAS	43	5	—	1	49
UNCLASSIFIED	2	—	63	48	113
Total Indian Cotton ..	771	393	1,228	828	3,220
Tota exports, as per official returns from British Indian and Kathiawar Ports—Bales of 400 lbs. net ..	826	402	1,288	851	3,367

* Standard Indian bales of approximate average gross weight 400 lbs. and net weight 392 lbs. of cleaned (lint) cotton.

APPENDIX

RECEIPTS AT MILLS IN INDIA OF

(Compiled from voluntary returns
1st *September* 1938 *to*
(In thousand bales*

Trade Descriptions of Cotton.	Bombay Island.	Ahmedabad.	Rest of Bombay Province.	Total Bombay Province.	Madras Province.	United Provinces.	C. P. & Berar.	Bengal.	Punjab and Delhi.	Rest of British India.
BENGALS—										
U. P. *Deshi*	4	..	..	4	..	124	..	7	3	..
Punjab *Deshi*	21	..	..	21	..	18	..	6	30	1
Sind *Deshi*	2	2	..	4	..	..	..	..	..	..
Rajputana *Deshi*	6	2	..	8	..	..	..	..	..	33
Unclassified	6	..	..	6	..	2	..	..	..	6
Total	39	4	..	43	..	144	..	13	33	40
AMERICANS—										
Punjab—289-F	70	5	2	77	30	19	2	10	5	1
Punjab—L. S. S.	11	2	..	13	9	4	6	5	7	..
Punjab (Unspecified—4-F)	84	3	1	88	28	118	2	33	77	8
Sind-Sudhar—(289-F-1)	37	7	1	45	7	..	1	..	..	..
Sind (Unspecified & 4-F-98)	19	11	1	31	39	1	..	..	..	1
Dharwar (Gadag 1)	8	..	6	14	..	..	..	..	..	..
Dharwar (Upland—Unspecified)	3	..	4	7	2	..	..	..	..	..
Cambodia (Coimbatore No. 2)	2	..	..	2	108	..	5	..	..	..
Cambodia (Unspecified)	1	..	1	2	33	..	..	2	..	..
Total	235	28	16	279	256	142	16	50	89	10
OOMRAS—										
C. P. and Nimar Oomras	7	..	3	10	..	..	44	10	..	..
Berar Oomras	11	..	5	16	..	..	26	1	..	..
C. P. and Berar Verum	3	1	1	5	..	..	20	..	..	..
Khandesh Oomras	12	..	14	26	..	..	..	..	..	..
Khandesh—Banilla	3	..	16	19	..	..	..	..	..	..
Barsi-Nagar Oomras	13	..	24	37	..	..	..	..	..	..
Hyderabad Oomras									..	..
Total	49	1	63	113	..	..	90	11	..	..
HYDERABAD GAORANI	6	..	23	29	..	..	10	..	..	..
CENTRAL INDIA—										
Malvi	11	4	1	16	..	6	..	..	..	..
Central India—Others	17	1	3	21	..	6	..	..	..	..
Total	28	5	4	37	..	12	..	..	..	..
BROACH	92	70	2	164	5	..	1	3	..	..
SURTI	59	79	6	144	3	..	1	..	..	..
DHOLLERAS—										
Gujarat Dholleras	32	118	3	153	..	..	..	..	..	2
Gujarat—Short Staple										
Kathiawar—Dholleras										
Kathiawar—Short Staple	20	1	..	21	..	..	..	..	..	..
Cutch—Dholleras	2	..	..	2	..	..	..	..	..	..
Total	54	119	3	176	..	..	..	..	..	2
SOUTHERNS—										
Kumptas (Jayawant)	40	1	3	44	9	..	1	..	..	..
Kumptas (Unspecified)	27	1	18	46	1	..	..	..	..	..
Bijapur and Bagalkot Jowari Westerns	43	9	54	106	24	1	..	1	..	..
White and Red Northerns	3	..	..	3	7	..	..	3	..	..
Warangal and Cocanadas	1	..	1	2	5	..	..	1	..	..
Total	114	11	76	201	46	1	1	5	..	..
TINNEVELLIES (Including Karungannies)										
Tinnevellies	2	..	..	2	58	..	..	5	..	..
Karungannies	1	..	..	1	55	..	..	..	..	..
Total	3	..	..	3	113	..	..	5	..	..
SALEMS—	..	..	..	..	3	..	..	..	..	..
COMILLAS	..	..	..	..	..	..	..	..	..	..
UNCLASSIFIED	1	1	..	2	5	..	..	..	..	..
Total Indian Cotton	680	318	193	1,191	431	299	119	87	122	52
AMERICANS	35	..	3	38	2	..	..	2	..	..
EGYPTIANS	20	47	..	67	7	..	1	1	1	..
EAST AFRICANS	71	116	8	195	4	..	1	10	1	..
OTHERS (Sudan, Burma, etc.)	36	23	2	61	5	..	1	3	..	..
Total Foreign Cotton	162	186	13	361	18	..	3	16	2	..
GRAND TOTAL	842	504	206	1,552	449	299	122	103	124	52
Indian raw cotton consumed in mills in India. (Figures compiled mainly from returns under the Indian Cotton Cess Act—Bales of 400 lbs. net.)	750	346	220	1,316	471	356	165	85	120	50

* Standard Indian bales of approximate average gross

VIII.

RAW COTTON CLASSIFIED BY VARIETIES.

furnished by mills.)
31*st August* 1939.
of 400 lbs. each.)

Total British India.	Hyderabad.	Mysore.	Baroda.	Gwalior.	Indore.	Kathiawar States.	Other Indian States.	Pondicherry.	Total Indian States.	GRAND TOTAL.	Trade Descriptions of Cotton.
											BENGALS—
138	..	..	..	10	..	..	..	..	10	148	U. P. *Deshi*
76	..	..	..	..	..	..	..	..	..	76	Punjab *Deshi*
4	..	..	..	..	..	..	..	1	1	5	Sind *Deshi*
41	..	1	..	1	2	..	5	..	9	50	Rajputana *Deshi*
14	..	2	..	..	1	..	..	1	4	18	Unclassified
273	..	3	..	11	3	..	5	2	24	297	Total
											AMERICANS—
144	..	2	1	..	3	..	3	1	10	154	Punjab—289-F
44	..	..	..	..	1	..	1	..	2	46	Punjab—L. S. S.
354	..	..	1	..	..	..	3	4	8	362	Punjab (Unspecified—4-F)
53	..	..	..	..	..	..	..	2	2	55	Sind-Sudhar—(289-F-1)
72	..	..	..	..	..	..	4	9	13	85	Sind (Unspecified & 4-F-98)
14	..	..	1	..	..	..	..	..	1	15	Dharwar (Gadag 1)
9	..	1	..	..	..	..	..	..	1	10	Dharwar (Upland—Unspecified)
115	..	1	..	..	..	..	6	..	7	122	Cambodia (Coimbatore No. 2)
37	..	2	..	..	..	..	..	..	2	39	Cambodia (Unspecified)
842	..	6	3	..	4	..	17	16	46	888	Total
											OOMRAS—
64	..	..	..	..	1	..	4	..	5	69	C. P. and Nimar Oomras
43	..	..	..	..	..	..	1	..	1	44	Berar Oomras
25	7	..	..	..	1	..	1	..	9	34	C. P. and Berar Verum
26	..	..	..	..	..	..	..	..	..	26	Khandesh Oomras
19	..	..	..	1	..	..	..	..	1	20	Khandesh—Banilla
37	3	..	..	..	..	..	..	..	3	40	Barsi-Nagar Oomras Hyderabad Oomras
214	10	..	..	1	2	..	6	..	19	233	Total
39	34	..	..	..	..	..	..	..	34	73	HYDERABAD GAORANI
											CENTRAL INDIA—
22	..	..	6	37	64	..	12	..	119	141	Malvi
27	..	..	..	4	40	..	..	..	44	71	Central India—Others
49	..	..	6	41	104	..	12	..	163	212	TOTAL
173	..	..	20	..	..	4	..	1	25	198	BROACH—
148	..	..	15	..	1	8	2	1	27	175	SURTI
											DHOLLERAS—
155	..	..	18	..	4	26	1	..	49	204	Gujarat Dholleras Gujarat—Short Staple Kathiawar—Dholleras
21	..	..	1	..	..	1	..	..	2	23	Kathiawar—Short Staple
2	..	..	1	..	..	..	..	..	1	3	Cutch—Dholleras
178	..	..	20	..	4	27	1	..	52	230	Total
											SOUTHERNS—
54	..	5	..	..	1	..	9	..	15	69	Kumptas (Jayawant)
47	..	1	2	..	..	..	1	..	4	51	Kumptas (Unspecified)
132	7	15	1	..	1	..	2	2	28	160	Bijapur and Bagalkot Jowari Westerns.
13	..	10	..	..	..	..	..	3	13	26	White and Red Northerns
8	9	..	..	..	..	..	..	1	10	18	Warangal and Cocanadas
254	16	31	3	..	2	..	12	6	70	324	Total
											TINNEVELLIES(Including Karungannies)
65	..	..	..	..	..	..	..	..	..	65	Tinnevellies
56	..	..	..	..	..	..	3	..	3	59	Karungannies
121	..	..	..	..	..	..	3	..	3	124	Total
3	..	..	..	..	..	..	..	..	..	3	SALEMS
..	..	..	..	..	..	..	..	..	..	..	COMILLAS
7	..	6	..	..	..	..	..	..	6	13	UNCLASSIFIED
2,301	60	46	67	53	120	39	58	26	469	2,770	Total Indian Cotton
42	..	..	..	..	..	..	..	..	..	42	AMERICANS
77	..	1	6	..	..	..	..	1	8	85	EGYPTIANS
211	..	4	23	..	1	5	2	..	35	246	EAST AFRICANS
70	..	..	1	..	..	..	1	..	2	72	OTHERS (Sudan, Burma, etc.)
400	..	5	30	..	1	5	3	1	45	445	Total Foreign Cotton.
2,701	60	51	97	53	121	44	61	27	514	3,215	GRAND TOTAL
2,563	68	53	73	94	141	44	58	27	558	3,121	Indian raw cotton consumed in mills in India. (Figures compiled mainly from returns under the Indian Cotton Cess Act—Bales of 400 lbs. net.)

weight 400 lbs. and net weight 392 lbs. of cleaned (lint) cotton.

APPENDIX IX.

Draft Agricultural Produce (Grading and Marking) (Cotton) Rules, 1939.

1. *Short title and application.*—

(1) These may be called the Agricultural Produce (Grading and Marking) (Cotton) Rules, 1939.

(2) They shall apply to cotton of specified botanical varieties grown in India.

2. *Grade designations.*—

Grade designation to indicate the characteristics and quality of cotton of specified varieties are set out in the first column of the annexed Schedule and shall only be applied to cotton in full pressed bales.

3. *Definition of quality.*—

(1) The special characteristics of quality indicated by the grade designations of each specified variety of cotton are set out in the second column of the relevant Schedule.

(2) The general characteristics of quality of each specified variety of cotton are set out in the third column of the relevant Schedule.

4. *Grade designation marks.*—

(1) The grade designation mark to be applied to each bale shall consist of a label bearing on a white ground the design set out in Schedule specifying the grade designation.

(2) The design and grade designation shall be of the following colour :—

Grade designation.	*Colour of design and lettering of label.*
AGMARK CERTIFIED PEDIGREED ..	Red.
AGMARK CERTIFIED	Black.

5. *Method of marking.*—

(1) The grade designation mark label shall be placed against one or other of the flat sides of a bale. It shall be fixed to the hessian cloth wrapper and shall be held securely in position by at least 3 hoops.

(2) The grade designation mark label shall clearly show the following particulars :—

(*a*) Grade designation.
(*b*) Taluka in which grown.
(*c*) Pressing factory.
(*d*) Date of pressing.

(3) The affixing of the grade designation mark label on an end hessian or an unlashed side of a bale shall not be deemed to fulfil the requirements of this rule.

6. *Method of packing.*—

(1) The cotton shall be baled as customary in the trade.

(2) The net weight of an unopened full pressed bale shall conform as nearly as possible to 392 lb. but a variation between minimum and maximum limits of 340 and 450 lb. may be permissible.

SCHEDULE

Grade designations and definitions of quality of the variety of cotton known botanically as 1027 A.L.F. belonging to the Surat type of cotton tenderable against the Broach contract of the East India Cotton Association and grown, ginned and pressed in the talukas of Ankleshwar, Hansot, Olpad and Mandvi in the district of Broach and in the talukas of Chorasi, Bardoli, Valed, Jalalpur and Chikhli in the district of Surat, in the talukas of Mangrol, Kamrej, Vyara, Palsana, Mahuwa and Navsari in Baroda and in Rajpipla.

Grade Designation.	Definition of Quality.	
	Special Characteristics.	General Characteristics.
AGMARK CERTIFIED PEDIGREED 1027 A.L.F.	(*a*) Shall be the product derived from the seed (kapas) of 1027 A.L.F., grown on a Government Farm or by a registered seed grower licensed by the appropriate Government Department, which has itself been derived from selfed seed, and shall have been rogued in the field and duly certified by the appropriate Government Departments as being at least 98 per cent pure, and (*b*) shall have been ginned and pressed under the direct supervision of the appropriate Government Department.	(*a*) Shall consist of lint (in half or full pressed bales) obtained by ginning (in roller gins) mature kapas. (*b*) shall be dry and free from any trace of added moisture. (*c*) shall be well ginned, clean and reasonably free from leaf, stain or other imperfections. (*d*) shall be of good colour (white or creamy), lustrous and silky. (*e*) The Bye-laws of the East India Cotton Association in regard to "False or Fraudulent Packing" shall apply in every case.
AGMARK CERTIFIED 1027 A.L.F.	(*a*) Shall be derived from kapas grown from certified 1027 A.L.F. seed obtained from a Government seed depôt or from a seed agency (of which the seed has been certified by the appropriate Government Department, as being of the standard of purity of the Government Seed Depôt) the crop of which shall have been examined in the field and have secured a certificate of adequate field purity from the appropriate Government Department, and (*b*) shall have been ginned and pressed respectively in the condition as delivered by the grower (whose crop has been certified) after examination and check at a ginning and pressing factory holding a licence for 1027 A.L.F. issued by the appropriate Government Department.	

APPENDIX X.

Draft Rules under the United Provinces Cotton Pest Control Act.

AGRICULTURE DEPARTMENT.

MISCELLANEOUS.

22nd September, 1938.

No. 6653-*A/XIIA*-620-36.—In exercise of the powers conferred by section 1(3) of the United Provinces Cotton Pest Control Act, 1936, the Governor is pleased to declare that the Act shall come into force in the following area with effect from 1st October, 1939:—

The area comprising the whole of the Aligarh District, and those parts of Bulandshahr, Muttra, Etah, and Budaun districts situated between the right bank of the Ganges river and the left bank of the Jumna river to the water's edge of the main stream for the time being and bounded on the north side by the road from the left bank of the Jumna river at Garhibegumpur ferry to Dankaur and thence by way of Bilaspur, Sikandrabad, Bulandshahr, and Anupshahar to the right bank of the Ganges and on the south side from the left bank of the Jumna river by the Mahaban, Sadabad, and Itmadpur tahsil boundary, the boundary between Jalesar tahsil and tahsils Itmadpur, Ferozabad and Mustafabad and the southern boundary of Etah tahsil to the point at which the Jalesar-Etah Road crosses the Etah-Mustafabad tahsil boundary and thereafter by the road through Etah, Sidhpura and towards Dundwarganj, to the point at which the Sidhupura Dundwarganj road crosses and Kasganj Aliganj tahsil boundary and thereafter following the Kasganj tahsil boundary to the right bank of the Ganges river.

Where any portion of a municipality, notified area, or village, falls within the area so prescribed, the whole of such municipality, notified area, or village shall be deemed to lie within the controlled area and the provisions of the United Provinces Cotton Pest Act, 1936, shall apply thereto as if the whole of such municipality, notified area, or village lay within the bounds of the controlled area as herein described.

Any areas of Indian State territory lying within the controlled area are excluded from the operation of the United Provinces Cotton Pest Act, 1936.

P. M. KHAREGAT,
Secretary.

COTTON PEST CONTROL RULES.

1. (1) The dates by which the ginning of raw cotton shall be completed in a controlled area will, subject to the provisions of section 3 of the Act, be determined by the District Magistrate after consulting the Deputy Director of Agriculture and representatives of the ginning factories in the controlled area.

(2) The dates so fixed shall be published in the *Gazette* by October 31 in each year; intimation of these dates will also be sent by the District Magistrate to the occupiers of the ginning factories concerned. The date by which raw cotton should be hand-ginned shall also be announced, in the controlled area at least one calendar month before the date so fixed, by beat of drum or such other method as the District Magistrate may decide.

(3) The dates fixed in accordance with sub-rule (1) may be altered and a subsequent date fixed by the District Magistrate if on receipt of a representation from representatives of the ginning industry or from those who have retained raw cotton for hand-ginning, he considers such a course necessary; provided that such subsequent dates are within the limits laid down in the Act.

2. (1) The dates by or between which the treatment of seed by exposure to the heat of the sun shall be completed will be determined by the District Magistrate.

(2) The dates so fixed shall be published in the *Gazette* at least one calendar month before such dates.

The dates between which seed should be treated by exposure to the heat of the sun shall also be announced, in each village of the controlled area where seed is known to have been retained for treatment by exposure to the heat of the sun, about a fortnight before the first of such dates by beat of drum or such other method as the District Magistrate may decide.

3. (1) Hand-ginned seed shall be treated by exposure in a layer one seed deep on a clean masonry or earth floor in bright sunshine for a period of not less than two hours between 10 a.m. and 3 p.m. during the first suitable day of the period of three days notified for the purpose for the village concerned, by beat of drum or otherwise as may be directed by the District Magistrate.

(2) Cotton seed other than hand-ginned seed shall be treated at a ginning factory by passing through an apparatus approved by the Director of Agriculture for the purpose in such manner that the seed shall attain a temperature at the outlet of 60-C provided that a maximum variation in temperature of between two degrees Centigrade below and above this temperature may be permitted. Each machine shall be provided with a thermostatic heat controlling apparatus capable of ensuring a steady temperature at the outlet within the limits of variation of 58-C and 62-C as prescribed above. Each machine shall be equipped with approved automatic recording thermograph which shall be in operation whenever the seed heating apparatus is in use and which shall provide a continuous record upon 24-hour charts which must be changed at regular 24 hour intervals.

Note.—Applications for loans for the installation of heating apparatus at ginning factories may be made to Government if necessary.

4. (1) An area shall not be notified as a controlled area until Government are satisfied after eliciting public opinion on the proposal that it would be in the interest of the cotton growers and the cotton industry to do so.

(2) The first area to be declared as a controlled area shall be as published in notification No. 6653-A/XIIA-620-36, dated the 22nd September, 1938.

(3) The notification declaring an area to be a controlled area shall be issued at least twelve months before the date from which the area is to be so declared.

5. (1) An application for a licence to import raw cotton or seed into a controlled area shall be made to the District Magistrate in Form A.

(2) It shall be stated in the application what consignments will be imported, to what place and what arrangements have been made for the ginning of the raw cotton or the treatment of the seed imported, as the case may be, in the case of each consignment.

(3) The District Magistrate shall, if he approves of these arrangements, issue the licence in Form B.

(4) No fee shall be payable for such licences.

(5) Separate licences shall be issued in respect of consignments imported for treatment at different ginning factories.

(6) The licensee shall return the licence to the District Magistrate within one week of expiry or completion of import whichever is earlier.

Note.—Raw cotton may be imported without a licence into a controlled area by any means of transport between 16th of September and the date notified in accordance with Rule 1. Between the date prescribed and 15th September next

following raw cotton may be imported only under licence and may be transported only by rail in closed wagons and such raw cotton must be ginned and the treatment of ginned seed completed within 48 hours of arrival at the place of ginning specified in the licence.

Ginned cotton seed may not be imported into a controlled area at any time except under licence and then only by rail in closed wagons. Such cotton seed, if it is not certified to have been already treated in the prescribed manner, must be treated as laid down in section 7 of the Act within 14 days of arrival and not later than 48 hours after the date prescribed for the treatment of local factory ginned seed, if imported between 16th September and such prescribed dates; and within 48 hours of arrival at the place of treatment if between the date prescribed for completion of treatment and 15th September next following.

6. (1) If the export of the raw cotton from a controlled area is prohibited except under a licence, an application for such licence shall be made to the District Magistrate in Form D stating the reasons for which such licence is desired.

(2) The District Magistrate shall if he is satisfied that the proposed export of raw cotton from the controlled area is required for trade purposes and does not tend to nullify the order under which the export of raw cotton has been prohibited grant the licence in the Form E.

(3) No fee shall be payable for such licence.

(4) An appeal shall lie against the refusal of a licence to the Director of Agriculture.

(5) The licensee shall return the licence to the District Magistrate within one week of expiry or completion of import whichever is earlier.

7. (1) The following records shall be maintained at any place where seed is treated in accordance with the provisions of rule 3 (2):

(*i*) A continuous automatic 24-hour thermograph record of the temperature at the seed outlet as measured by the approved thermograph. This shall be on a 24-hour thermograph chart of the type which is standard for the thermograph in question.

(*ii*) Each chart shall bear in clear writing in ink the date and time at which it was put into and removed from the thermograph, such dates and time to be written at the time of putting into and removal from the apparatus.

(*iii*) A record of all raw cotton received for ginning which shall contain the following particulars:

(*a*) the name of the owner of the raw cotton;

(*b*) the weight of raw cotton;

(*c*) the date of ginning and the date of receipt of the consignment of cotton;

(*d*) the weight of lint;

(*e*) the weight of seed after treatment;

(*f*) the date of treatment of seed;

(*g*) the date of removal of seed from ginning premises;

(*h*) the names of the person or persons by or for whom seed was removed.

(2) All such prescribed records shall be preserved for a minimum period of one calendar year.

8. (1) The members of the Board of Revenue and the Director of Agriculture shall be inspectors under the Act and will exercise jurisdiction throughout the province in respect of all the matters referred to in section 10 of the Act.

(2) The Commissioners of Divisions and District Officers shall be inspectors under the Act and will exercise jurisdiction in their divisions and districts respectively in respect of all the matters referred to in section 10 of the Act.

(3) Deputy Directors of Agriculture shall be inspectors under the Act and will exercise jurisdiction throughout their circles in respect of all the matters referred to in section 10 of the Act except the prescribing of the dates of the termination of ginning and of seed treatment and the issue of licences.

(4) Such members of the revenue staff of rank not lower than Tahsildars and in special cases of Naib-Tahsildars as may be authorized in this behalf by the District Magistrate, and such employees of the Agriculture Department of rank not lower than Group II and in special cases of Group III of the Subordinate Agricultural Service (General Section) as may be authorized by the Deputy Director of Agriculture, and such other special staff of similar status as may be authorized by the Deputy Director of Agriculture, shall be inspectors under the Act for such areas as they may be authorized, in respect of the inspection of ginning factories, wholesale raw cotton, cotton seed stores, and the prescribed records or registers.

(5) Such members of the revenue staff of rank not lower than Kanungos as may be authorized by the District Magistrate and such employees of the Agriculture Department of rank not lower than Group IV and in special cases of Group V of the Subordinate Agricultural Service (General Section) or other special staff of similar status as may be authorized by the Deputy Director of Agriculture shall be inspectors under the Act for such areas as they may be authorized, in respect of the inspection of raw cotton and cotton seed held by cultivators.

9. Inspectors who are members of the Revenue staff of rank not lower than Kanungos and employees in the Agricultural Department of rank not lower than Group IV of the Subordinate Agricultural Service (General Section) are empowered to carry out the orders of the Court under sub-section 2, section 12, and to employ the necessary labour, implements, draft cattle and transport or to purchase and use the necessary material and to report to it all expenses incurred in carrying out the direction of the Court.

FORM A.

UNITED PROVINCES COTTON PEST CONTROL ACT, 1936.

Application for licence to import raw cotton or cotton seed into a controlled area.

(1)	(1) Name.
of (2)	(2) Address and trade name.
(3)	(3) Occupation.
hereby apply for permission to import (4).....	(4) Quantity.
.....	
maunds of (5) raw cotton (kapas)/cotton seed by rail in closed wagon or wagons consigned to (6).....	(5) Strike out the commodity not required.
.....Railway station on or before	(6) Name of station.
(7)	(7) Date.
and I hereby undertake to convey such (8) raw cotton/cotton seed forthwith after opening of the wagon or wagons to (9)	(8) Strike out the unwanted words.
	(9) Place.
where I have made arrangement with (10).....	(10) Name of firm which will gin the raw cotton and/or treat the seed.
.....	
.....	
to gin the (11) raw cotton and treat the seed within the period laid down by the Act and the Cotton Pest Control Rules.	(11) Strike out the unwanted words.
(12)	(12) Signature.
.....	

N.B.—Section 7 of the United Provinces Cotton Pest Control Act, 1936, and rules framed under the Act includes provision for regulating the importation of raw cotton (kapas) and cotton seed into a controlled area.

Raw Cotton.—During the period after the 15th of September and before the date prescribed under the Cotton Pest Control Rules for completion of ginning other than by hand, there is no restriction upon import of raw cotton by any means of transport.

After such prescribed date and up to 15th September next following raw cotton may be imported only under licence and by railway in closed wagons. Raw cotton so imported must be removed forthwith after opening of the railway wagon to the place of ginning specified in the licence and must be ginned and the seed treated as prescribed in the Act and the rules framed under it within 48 hours of arrival at such specified place.

Cotton Seed.—No cotton seed may be imported into a controlled area at any time except under licence. Any cotton seed so imported must be conveyed by railway in covered wagons. Importation in any other manner is absolutely forbidden.

Cotton seed so imported must be conveyed forthwith after the opening of the railway wagon to the place of treatment specified in the licence and must there be treated as laid down in sub-sections (3) and (4) of section 7 of the Act and in the rules under the Act.

Such cotton seed, if imported during the prescribed ginning season for the area, which is after the 15th of September and up to a date fixed and notified by the District Magistrate next following must be treated within forty-eight hours of arrival at the place specified and not later than nine days after the date so prescribed for completion of ginning.

Cotton seed so imported between such prescribed date and the 15th of September next following must be treated within forty-eight hours of arrival at the place specified in the licence.

Cotton seed imported from any other controlled area is exempt from treatment provided that it is certified in the prescribed manner that it has already been treated in such other controlled area.

The provisions of the Act do not apply to raw cotton or cotton seed under transport through a controlled area by rail in closed wagons.

The licensing and certifying authority is the District Magistrate to whom application should be made in the prescribed form.

No fee is payable for issue of a licence.

FORM B.

UNITED PROVINCES COTTON PEST CONTROL ACT, 1936.

Licence to import raw cotton or coton seed into a controlled area.

(1)	(1) Name.
of (2).....	(2) Address and trade name, if any.
(3)	(3) Occupation.
is hereby permitted to import (4).....	(4) Quantity.
.....	
maunds of (5) raw cotton (kapas)/cotton seed by rail in closed wagon or wagons consigned to (6).....	(5) Strike out the commodity not required.
.....Railway	(6) Name of station.
station on or before (7)	(7) Date.
on the conditions that such (8) raw cotton/cotton seed will be conveyed forthwith after opening of the wagon or wagons to (9) ..... and that	(8) Strike out unwanted word. (9) Place.
such (10) raw cotton/cotton seed will be ginned and	(10) Strike out unwanted words.
treated by (11).....	(11) Name of firm which will gin the raw cotton and/or treat the seed.
.....	
within the period prescribed by or under the rules framed under the Act.	
(12)	(12) Signature and designation
.....	of Licensing authority.

N.B.—(*i*) This licence is issued subject to the provisions of the United Provinces Cotton Pest Control Act of 1936 and of rules framed thereunder. It is valid only up to the date and quantity and under the conditions shown therein. Departure from the terms of the licence renders the importer and/or his agents liable to the penalties provided in the Act.

(*ii*) This licence must be produced for inspection if so required by an Inspector authorized under the Act while the consignment is at the Railway station of destination or during its conveyance within the controlled area or prior to or during ginning and/or treatment.

(*iii*) This licence must be produced at the railway station and particulars of the consignment entered below and signed by the appropriate member of the Railway staff before the consignment may be unloaded from the wagon or wagons.

Quantity of raw (13) cotton/cotton seed.	Date.	Number of Railway consignment note.	Signature.

(13) Strike out unwanted words.

(*iv*) This licence must be returned to the issuing authority within one week of expiry or completion of import whichever is earlier.

FORM C.

UNITED PROVINCES COTTON PEST CONTROL ACT, 1936.

Certificate of treatment of cotton seed imported into a controlled area from any other controlled area.

I, (1) ..... (1) Name of consignor.
of (2) ..... (2) Address and trade name, if any.
(3) ..... (3) Occupation.
hereby certify that cotton seed consigned by me to the order of (4) ..... (4) Name of consignee.
(5) ..... (5) Address and trade name.
consisting of (6) ..... (6) Quantity in words.
..... maunds of cotton seed in closed wagon or wagons to (7) ..... (7) Name of railway station.
..... under consignment note number (8) has been treated as prescribed in the United Provinces Cotton Pest Control Act, 1936, of the rules framed under the Act. (8) Number.

(9) ..... (9) Signature of consignor.
and I, (10) ..... (10) Name of consignee.
of (11) ..... (11) Address and trade name.
(12) ..... (12) Occupation.
hereby certify that to the best of my knowledge and belief the declaration made by (13) ..... (13) Name of consignor.
above is correct.

(14) ..... (14) Signature of consignee.
.....

Countersignature by Licensing authority.

Cotton seed imported by (15) ..... (15) Name of consignee.
.....under the above declaration is exempted under sub-section (2) of section 7 of the United Provinces Cotton Pest Control Act of 1936 from the treatment prescribed by or under rules framed under the Act for cotton seed imported into a controlled area.

(16) ..... (16) Signature and designation
..... of the licensing authority.

N.B.—(*i*) This certificate is issued subject to the provisions of the United Provinces Cotton Pest Control Act, 1936, and the rules framed under the Act, it is valid only for the quantity and actual consignment shown therein.

(*ii*) This certificate must be produced for inspection if so required by an Inspector authorized under the Act at any time prior to the disposal of the cotton seed by the importer.

FORM D.

UNITED PROVINCES COTTON PEST CONTROL ACT, 1936.

Application for licence to export raw cotton from a controlled area.

I, (1)	(1) Name.
of (2)	(2) Address and trade name, if any.
(3)	(3) Occupation.
hereby apply for permission to export (4)	(4) Number of maunds in words.
.....maunds of (5) raw cotton (kapas)	
from	(5) State place. If by rail give despatching station.
in the district of (6).....	(6) Name of district.
to (7)	(7) Destination.
in the district of (8)	(8) Name of district.
by (9)	(9) Mode of transport, *i.e.*, rail, river or road.
(10)	(10) If by road indicate when the consignment will leave the controlled area.
on or before (11)	(11) Date.
.....	
I desire to export the raw cotton to the quantity specified for the purpose of (12)	(12) State reason for requiring licence.
.....	
(13)	(13) Signature of applicant.
.....	

Export of raw cotton (Kapas).

Section 8 of the United Provinces Cotton Pest Control Act of 1936 makes provision for prohibiting export of unginned cotton from a controlled area during such period as may be specified in a Government order to that effect. During such periods kapas may be exported under licence only. Rules for the granting of such licence have been framed as Rule 6 of the Cotton Pest Rules as follows :

6. (1) If the export of the raw cotton from a controlled area is prohibited except under a licence, an application for such licence shall be made to the District Magistrate in form D stating the reasons for which such licence is desired.

(2) The District Magistrate shall if he is satisfied that the proposed export of raw cotton from the controlled area is required for trade purposes and does not tend to nullify the order under which the export of raw cotton has been prohibited grant the license in the form E.

(3) No fee shall be payable for such licence.

(4) An appeal shall lie against the refusal of a licence to the Director of Agriculture.

(5) The licensee shall return the licence to the District Magistrate within one week of expiry or completion of import whichever is earlier.

The licensing and certifying authority is the District Magistrate to whom application should be made in the prescribed form.

No fee is payable for issue of a licence.

FORM E.

UNITED PROVINCES COTTON PEST CONTROL ACT, 1936.

Licence to export raw cotton from a controlled area.

(1)	(1) Name.
of (2)	(2) Address and trade name, if any.
(3)	(3) Occupation.
.....	
is hereby permitted to export (4)	(4) Number of maunds in words.
.....maunds of (5) raw cotton (kapas) from	(5) State place. If by rail give despatching station.
in the district of (6)	(6) Name of district.
to (7)	(7) Destination.
in the district of (8)	(8) Name of district.
by (9)	(9) Mode of transport, *i.e.*, rail, river or road.
(10)	(10) If by road indicate when the consignment will leave the controlled area.
on or before (11)	(11) Date.
for the purpose of (12)	(12) State reason.
.....	
(13)	(13) Signature of issuing authority and designation.

N.B.—(*i*) This licence is issued subject to the provisions of the United Provinces Cotton Pest Control Act of 1936 and of rules framed thereunder. It is valid only up to the date and quantity and under the conditions shown therein. Departure from the terms of the licence renders the exporter and/or his agents liable to the penalties provided in the Act.

(*ii*) This licence must accompany the consignment to the despatching station or place of leaving the controlled area, and must be produced for inspection, if so required by an Inspector authorised under the Act.

(*iii*) If the raw cotton is to be conveyed by railway or other common carrier this licence must be produced at the time of delivery to such common carrier who is required to enter in the space below the quantity in maunds accepted for conveyance along with the date of receipt and the destination to which the consignment is booked.

Quantity of raw cotton, maunds.	Date.	Destination.	Signature.

(*iv*) This licence must be returned to the issuing authority within one week of expiry, or completion of export whichever is earlier.

APPENDIX XI.

Cotton Ginning and Pressing Factories (Amendment) Act, 1939 and Amendments to Cotton Ginning and Pressing Factories Rules, 1925.

WHEREAS it is expedient to amend the Cotton Ginning and Pressing Factories Act, 1925 for the purposes hereinafter appearing : XII of 1925.

It is hereby enacted as follows :—

1. *Short title.*—This Act may be called the Cotton Ginning and Pressing Factories (Amendment) Act, 1939.

2. *Amendment of section 9 of Act XII of 1925.*—In section 9 of the Cotton Ginning and Pressing Factories Act, 1925 (hereinafter referred to as the said Act)—

(*a*) after sub-section (1) the following sub-section shall be inserted, namely :—

"(1A) In any cotton ginning factory, whether erected before or after the commencement of this Act—

(*a*) no structural alterations or additions, the construction of which commenced after the 27th day of February, 1939, shall be made so as to minimise the degree of compliance of the factory as a whole with the requirements set forth in clauses (*a*) and (*b*) of sub-section (1), and

(*b*) every structural addition (whether actually attached to any existing structure in the factory or not), the construction of which commenced after the last-mentioned date, shall be constructed in accordance with plans and specifications approved by the prescribed authority :

Provided that nothing in this sub-section shall apply to any factory in which, after any alteration or addition has been made, only roller gins are used where the number of such gins is not more than four " ;

(*b*) in clause (*a*) of sub-section (4), after the word, figure and brackets " sub-section (1) " the word, letter, figure and brackets, " sub-section (1A) " shall be inserted.

3. *Amendment of section 14.*—(1) Section 14 of the said Act shall be renumbered as sub-section (1) of section 14, and in the said section as so renumbered—

(*a*) for the words and figure " in accordance with section 4 " the words and figure " with the mark prescribed under section 4 for the factory in which they were pressed," shall be substituted ;

(*b*) the proviso shall be omitted.

(2) To the said section as so renumbered the following sub-section shall be added namely :—

I of 1872. " (2) Any bale marked in accordance with the provisions of section 4 shall, within the meaning of the Indian Evidence Act, 1872, be presumed for all purposes as between the parties to a contract for the purchase of baled cotton, to have been so marked before leaving the factory in which it was pressed."

G. H. SPENCE,
Secy. to the Govt. of India,
Legislative Department.

Indian Cotton Ginning and Pressing Factories Rules 1925, Amendments to—.

No. 50-C (1)/38.

GOVERNMENT OF INDIA.

DEPARTMENT OF COMMERCE.

SIMLA, *the 19th August* 1939.

NOTIFICATION.

COMMERCE.

In exercise of the powers conferred by section 12 of the Cotton Ginning and Pressing Factories Act, 1925 (XII of 1925), the Central Government is pleased to direct that, with effect from the 1st September 1939, the following further amendment shall be made in the Indian Cotton Ginning and Pressing Factories Rules, 1925, namely :—

For rule 7 of the said Rules, the following rule shall be substituted, namely :—

" 7. Every bale of cotton pressed in a cotton pressing factory shall be marked in the following manner :—

(1) The Special Mark and the Serial Number shall be in English figures and letters and shall be decipherable.

(2) The Special Mark and the Serial Number shall be punched on one or more of the hoops or stencilled on the hessian on the lashed side of the bale or may be both so punched and stencilled, provided however that, if stencilled, such Mark and Number shall not be stencilled on an end hessian."

(A. H. LLOYD),

Additional Secretary to the Government of India.

APPENDIX XII.

The Central Provinces and Berar Cotton Ginning and Pressing Factories (Amendment) Bill, 1939.

A Bill further to amend the Cotton Ginning and Pressing Factories Act, 1925, in its application to the Central Provinces and Berar.

Preamble.—Whereas it is expedient further to amend the Cotton Ginning and Pressing Factories Act, 1925, in its application to the Central Provinces and Berar for the purpose hereinafter appearing. XII of 1925.

It is hereby enacted as follows :—

1. *Short title.*—This Act may be cited as the Central Provinces and Berar Cotton Ginning and Pressing Factories (Amendment) Act, 193 .

2. *Insertion of Section 2-B, Act XII of* 1925.—After section 2-A of the Cotton Ginning and Pressing Factories Act, 1925, the following section shall be deemed to be inserted, namely :— XII of 1925.

Control of rates chargeable for ginning and pressing cotton.—" 2-B. (1) This section shall come into force from such date as the Provincial Government may, by notification, direct and shall remain in operation for a period of five years from that date.

(2) The Provincial Government may, by notification, extend this section to any local area, and during the continuance of such notification no owner or person in charge of a cotton ginning or cotton pressing factory situate in such local area shall charge for the ginning or pressing of cotton, rates in excess of such maxima as may be fixed by the rate-fixing committee of such local area under sub-section (7).

(3) There shall be a rate fixing committee for each local area, in which a notification under sub-section (2) is in operation. Such Committee shall consist of the Deputy Commissioner of the district, who shall be the chairman of the Committee, and the following members, namely :—

(*a*) two representatives of cotton growers of the local area;

(*b*) two representatives of owners of cotton ginning and cotton pressing factories in the local area ;

(*c*) one non-official possessing special or technical knowledge of cotton ginning and pressing or of cotton trade to be nominated by the Director of Industries of the province;

(*d*) the Chief Inspector of Factories and Boilers of the province.

(4) The two representatives referred to in clause (*a*) of sub-section (3) shall be elected by cotton growers whose names are for the time being included in the voters' lists of the cotton growers' electorates formed for the constitution of market committees for the management of any cotton markets established or deemed to be established in the local area under the Central Provinces Cotton Market Act, 1932, or the same Act as applied to Berar : IX of 1932.

Provided that, if there is no such cotton market established in the local area, the said two representatives shall be selected by the District Council from amongst the cotton growers of the local area.

(5) The two representatives referred to in clause (*b*) of sub-section (3) shall be elected by the owners of cotton ginning and cotton pressing factories in the local area from amongst themselves.

(6) The Provincial Government may make rules providing for and regulating the election and selection of the representatives referred to in clauses (*a*) and (*b*) of sub-section (3), the manner of election and selection, the preparation of voters' lists, where necessary the filling of any casual vacancies and all matters connected with such election and selection.

(7) The Provincial Government may make rules laying down the principles to be observed and the procedure to be followed by the committee in fixing the maxima rates for each season and the rates so fixed by the committee shall be duly made known by the Deputy Commissioner to all concerned in the local area before the commencement of the season in such manner as may be prescribed in the said rules :

Provided that, it shall not be necessary to fix such rates for any season for which, or for any place in which, no ginning or pressing pool has been formed.

Explanation.—A ' ginning or pressing pool ' means a system by which the owners or persons in charge of cotton ginning or cotton pressing factories combine for the purpose of charging the same rates for ginning or pressing cotton and sharing in the earnings upon certain terms and conditions settled by agreement or otherwise.

(8) The provisions of section 13 shall apply to the making of rules under sub-sections (6) and (7).

(9) Whoever contravenes the provisions of sub-section (2) shall be punishable with fine which may extend to five hundred rupees.

(10) While this section is in operation the figure and letter ' 2-B ' shall be deemed to be inserted after the words ' for the purpose of sections ' in sub-section (1) of section 7."

STATEMENT OF OBJECTS AND REASONS.

In March 1938 the Provincial Government had appointed a committee to examine the question of the formation of pools of ginning and pressing factories, with reference to its effect on ginning and pressing rates, and to report what action should be taken by them to regulate the rates with due regard to the interests of cotton-growers and owners of ginning and pressing factories. The committee found that the general tendency of the pools which have continued in existence for over two decades had been to push up the rates of ginning and pressing and to maintain them at an unduly high level to the detriment of the interests of the cotton-growers. Its main recommendation is that Government should regulate the rates by appointing rate fixing committees which will prescribe maxima rates for ginning and pressing. Government has accepted this recommendation and with a view to implementing it proposes to amend the Cotton Ginning and Pressing Factories Act.

2. As this is a novel measure and involves a certain amount of interference with industry, Government proposes to restrict its operation to a period of five years at the end of which the position will be reviewed. [Section 2B (1).] The Act will be applied to selected areas in which it is demonstrated that the system of pools operates to the detriment of the interests of the cotton-growers. [Section 2B (2).] Sub-sections (3), (4) and (5) of the proposed section 2B describe the composition of rate-fixing committees, while sub-section (9) provides that any person charging more than the maxima rates shall be punishable with a fine up to Rs. 500.

C. J. BHARUKA,
Member in charge.

NAGPUR : *The 11th April* 1939.

APPENDIX XIII.

Bombay Cotton Ginning and Pressing Factories Rules 1925,—Amendments to—.

REVENUE DEPARTMENT.

Bombay Castle, 9th January 1939.

In exercise of the powers conferred by sub-section (1) of section 13 of the Cotton Ginning and Pressing Factories Act, 1925 (XII of 1925), the Government of Bombay is pleased to amend the Bombay Cotton Ginning and Pressing Factories Rules, 1925, published in Government Notification, General Department, No. 6389-A, dated 25th August 1925, as follows, namely :—

1. After rule 2 of the said rules, the following shall be inserted, namely

" 2A. An admixture of cotton within the meaning of clause (aa) of sub-section (1) of section 2 shall mean such mixture of different varieties of cotton in respect of any area as may be notified by the Provincial Government in the Official Gazette.

" 2B. *Season.*—The following period shall constitute a season in each year :—

(1) In the districts of East and West Khandesh and Nasik.	1st October to 15th June.
(2) In the districts of Belgaum, Dharwar, Bijapur and Kanara.	1st March to 31st July.
(3) In the districts of Ahmedabad, Kaira, Surat and Broach and Panch Mahals.	15th January to 30th June.
(4) In other areas	1st August to 31st July.

" 2C. *Licence.*—(1) An application for the grant of a licence under sub-section (1) of section 2A shall be made by the owner of a cotton ginning factory or a cotton pressing factory to the Collector within the local limits of whose jurisdiction such factory is situated.

(2) The fee on payment of which a licence for a cotton ginning factory or a cotton pressing factory shall be granted shall be Rs. 10. Every application for a licence shall be supported by a treasury receipt showing the payment of the said amount of Rs. 10 in the treasury. Every licence shall remain in force for one year from the date of its commencement, which shall be entered in the licence and on the expiry of the said period a fresh licence shall be granted only on payment of a fresh fee of Rs. 10.

(3) Subject to the restrictions imposed by or under the Act, or under these rules, a licence shall be issued in the form in schedule ' E ' hereto.

(4) No licence for any cotton ginning or cotton pressing factory constructed after the commencement of these rules shall be granted except upon the production of a certificate from the Chief Inspector of Factories, Bombay, that the provisions of sub-sections (1) and (2) of section 9 have been complied with."

2. After rule 3 of the said rules, the following shall be inserted, namely :—

" 3A. *Particulars of cotton ginning factories.*—The particulars of a cotton ginning factory to be entered in the register maintained under sub-section (2) of section 3 shall include the name of the factory, its situation and the name of the owner or lessee.

"3B. *Proportion of seed.*—The proportion of seed prescribed under sub-section (2) (*a*) of section 3A shall be one per centum.

" 3C. *Authority competent to give a certificate of moisture.*—(1) For the purposes of section 3A the Director of Agriculture or the Deputy Director of Agriculture of the Division concerned shall be the authority competent to give a certificate as to the normal quantity of moisture which a given quantity of cotton should have, and the quantity of moisture which it actually possesses.

(2) Such certificate may be based on—

(*a*) an analysis of the cotton carried out at any Agricultural Research Station of the Agricultural Department in the Province of Bombay or at the laboratory of the Indian Central Cotton Committee, Matunga, Bombay, at the request of the Director of Agriculture, or

(*b*) the report of such members of the East India Cotton Association, not less than two in number— selected by the Board of Directors of the East India Cotton Association at the request of the Director of Agriculture from the panel of arbitrators elected under the rules in force for the time being of the said Association.

" 3D. *Complaint of offences.*—(1) A Complaint that there has been a contravention of section 3A or 3AA in respect of any cotton, package or bale shall be made in writing to the Director of Agriculture or the Deputy Director of Agriculture of the Division in which cotton was pressed and shall be accompanied by a sample of the cotton complained of:

Provided that no such complaint shall be entertained unless a fee of rupees fifty in respect of such cotton or of rupees ten in respect of each such package or bale with a minimum fee of rupees fifty, is paid at the time of making the complaint.

(2) The Director of Agriculture or the Deputy Director of Agriculture of the Division concerned, on receipt of such complaint, shall cause the cotton, package or bale in respect of which the complaint has been made to be seized and sealed and shall examine the same himself or forward it for examination and report to any other authority prescribed in rule 3E.

Note.—The fee prescribed in sub-rule (1) shall be recoverable in the case of bales in respect of the actual number of bales to be opened for examination (subject to a minimum of 10 per cent. of a consignment) and not in respect of the total number of the bales in respect of which the complaint is made.

" 3E. *Authority competent to examine cotton, etc.*—The authorities competent to examine such cotton or the contents of such package or bale shall be—

(1) The Director of Agriculture,

(2) the Deputy Director of Agriculture,

or

(3) any two persons appointed by the Board of Directors of the East India Cotton Association at the request of the Director of Agriculture from the panel of arbitrators elected under the rules in force for the time being of the said Association. An appeal shall lie against the decision of these two persons, to the Appeal Committee of the Association. The decision of these two persons, if no appeal is filed against it within seven days or of the Appeal Committee of the Association if an appeal has been filed, shall be final.

" 3F. *Sealing of cotton seized.*—After the examination referred to in rules 3D and 3E the cotton, package or bale shall be resealed in the manner prescribed in rule 3D.

" 3G.—*Manner of sealing.*—All things seized and required to be sealed under the Act shall be sealed with the official seal of the officer sealing the same and, if the owner or the person in charge of the factory so desires, also with the seal, if any, which he may provide for this purpose."

3. After Schedule D to the said rules the following new schedule shall be inserted, namely :—

SCHEDULE E.

Form of licence (Rule 20).

1. Name of Factory.
2. Description of the place where it is situated.
3. Name, description and place of residence of the owner of the factory.
4. Purpose for which licence is granted.
5. Date of commencement of licence.
6. Fee paid.

CONDITIONS.

This licence is granted subject to the provisions of the Cotton Ginning and Pressing Factories Act, 1925 (XII of 1925) and the Bombay Cotton Ginning and Pressing Factories Rules, 1925.

It shall remain in force for one year from the date of its commencement."

By order of the Governor of Bombay,

E. W. PERRY,

Secretary to Government.

APPENDIX XIV.

Baroda State Cotton Ginning and Pressing Factories Amendment Act, 1939.

BARODA ACT NO. 26 OF 1939.

Published on 29th June 1939.

An Act to amend the Cotton Ginning and Pressing Factories Act of 1925.

Object.—Whereas it is expedient to amend the Cotton Ginning and Pressing Factories Act of 1925, it is hereby enacted as follows :—

Title.—This Act may be called the Cotton Ginning and Pressing Factories Amendment Act.

2. *Addition of sub-section* 5(a1), (*h*), (*i*) *and* (*j*).—In Section 4 of the said Act, after the sub-section (*a*), the sub-section (a1), and after the sub-section (*g*) the sub-sections (*h*), (*i*), (*j*) are newly added as follows :—

" (a1) " mixture " means the mixture of different varieties of cotton.

(*h*) " Licence " means a licence granted under section 4(*a*).

(*i*) " Season " means such period as may from time to time be prescribed.

(*j*) " Indian Central Cotton Committee " means the Indian Central Cotton Committee according to the laws of British India Cotton Cess. This also includes any such Sub-Committee as appointed by this Committee."

3. *Addition of new section* 4*A after section* 4.—After section 4 of the said Act, new section 4 A, is inserted as follows :—

" 4A. (1) No cotton ginning factory or cotton pressing factory shall be worked without a licence granted to the owner thereof by such authority, in such form, subject to such conditions and on payment of such fee as may be prescribed.

(2) (*a*) A licence for which the prescribed fee has been paid shall be liable to be refused only on the ground that the owner or person in charge of a cotton ginning or cotton pressing factory in respect of which a licence is applied for has been convicted of an offence punishable under this Act.

(*b*) A licence shall be liable to be suspended, withdrawn or cancelled only on the ground that the owner or person in charge of the cotton ginning or cotton pressing factory in respect of which a licence was granted has been convicted of an offence punishable under this Act.

Provided that no licence shall be suspended, withdrawn or cancelled under this clause until after the expiration of the season in which the said owner or person has been so convicted.

(3) If any person works a cotton ginning or cotton pressing factory in respect of which a licence has not been granted or has been suspended, withdrawn or cancelled, such person shall be punishable

(*a*) on a first conviction, with fine which may extend to five hundred rupees and, if the offence has continued for more than one day, with an additional fine which may extend to one hundred rupees for every day subsequent to the first day during which the offence has continued ; and

(*b*) on every subsequent conviction, with fine which may extend to fifteen hundred rupees and, if the offence has continued for more than one day, with an additional fine which may extend to two hundred rupees for every day subsequent to the first day during which the offence has continued."

4. *Addition of new sub-section* (2) *cancelling the original sub-section* (2) *of the section* 5.—(1) The sub-section (2) of the section 5 of the said Act is omitted and in its place, the following new sub-section is introduced :—

" 2 (*a*) Every owner of the cotton ginning and pressing factory should maintain a register regarding pressing of bales in the prescribed form.

(*b*) In the register, to be kept according to the above sub-section 2 (*a*), a daily record of the following should be kept:—

(*i*) the number of cotton bales pressed in the factory ;

(*ii*) the serial number of each bale ;

(*iii*) the name of the person for whom the bales are pressed; and

(*iv*) the information of the details of the factories in which the cotton was ginned, given by the person who brings the cotton for baling."

Amending the sub-section (6) *of section* 5.—(2) In sub-section (6) of section 5 of the said Act, the following new words are introduced :—

(*a*) " Fine up to rupees fifty " in place of " Fine up to rupees twenty-five " and

(*b*) " Fine extending to rupees five hundred " in place of " Fine extending to rupees one hundred".

5. *Introducing new sub-sections* 5*a*, 5*b and* 5*c in the section* 5.—The sub-sections 5*a*, 5*b*, and 5*c* are inserted after sub-section (6) in section 5 of the said Act as follows :—

" 5*a*. (*i*) The Government, by notification in the Adnya-Patrika declare that in any area specified in such notification, no cotton which is ginned and pressed in a cotton ginning or cotton pressing factory shall contain any admixture of cotton.

(*ii*) Any owner of a cotton ginning or cotton pressing factory or any person in charge of such factory,

(*A*) who knowing or having reason to believe that any cotton is watered or contains seed in excess of the prescribed proportion or contains any foreign substance, gins or presses or allows such cotton to be ginned and pressed in such factory, or

(*B*) who in any area specified in the notification under sub-section (1) gins or presses or allows to be ginned or pressed any cotton which he knows or has reason to believe to contain an admixture of cotton,

shall, on conviction, be punishable with fine which may extend to five thousand rupees.

(*iii*) Any owner of cotton who knowingly waters any cotton which is ginned and which is being, or is intended, to be pressed in a cotton pressing factory, or mixes seed or foreign substance with such cotton, or in any area specified in sub-section (*i*) makes any admixture of cotton, or abets or knowingly allows or connives at any such watering, mixing, or admixture of cotton, shall, on conviction, be punishable with fine which may extend to five thousand rupees.

Explanation.—For the purposes of this section cotton shall not be deemed to be watered unless such cotton contains moisture in excess of the normal quantity. The normal quantity of moisture in any given quantity of cotton is the amount of moisture that such cotton is reasonably expected to have, regard being had to the place or places at or to which, and the time of the year in which, such cotton has been picked, collected, stored, conveyed, left, ginned or pressed. A certificate given by the prescribed authority as to the normal quantity of moisture that a given quantity of such cotton should have and the quantity of moisture that it possesses shall be evidence of such matters, until the contrary is proved ; and if the latter quantity exceeds the former it shall be evidence, until the contrary is proved, that the cotton is watered.

5 (*b*) (1) The officer appointed or authorised by the Huzur in this behalf may on his own motion or on receipt of a complaint that there has been a contravention of the provisions of (5) (*a*) in respect of any cotton, package or of any bale and in the case of a complaint, on the payment of the prescribed fee by the complainant, cause such cotton or the contents of such package or bale to be examined by the prescribed person or body.

(2) A certificate given by such person after examination of the contents of any bale under sub-section (1) shall be admissible in evidence and be presumptive proof of the facts mentioned therein until the contrary is proved.

5 (*c*) (1) The Huzur may authorise any officer to enter into and inspect, at any reasonable time, any cotton ginning or cotton pressing factory for the purpose of ascertaining whether there is any contravention therein of any of the provisions of this Act or of a rule made thereunder or of any of the conditions subject to which a licence has been granted in respect of such factory and to seize all things in respect of which an offence punishable under this Act appears to have been committed.

(2) The owner or the person in charge of every cotton ginning and pressing factory shall give every reasonable assistance to the inspecting officer in the performance of his duties under sub-section (1).

(3) The owner or the person in charge of such factory shall, in every instance, be permitted to attend during the inspection and the things seized during such inspection shall be sealed in the prescribed manner."

6. *Amendment of sub-section 2 of section* 6.—In the sub-section (2) of section (6) of the said Act the words " up to rupees twenty-five " are replaced by words " up to rupees fifty."

7. *Cancelling sub-section* 6 (*a*) *of section* 6.—The sub-section 6 (*a*) of the section 6 of the said Act is cancelled.

8. *Introducing new section in place of section* 7.—For section 7 with the explanatory note of the said Act, the following section shall be substituted :—

" 7 (1) The owner of every cotton ginning factory shall submit to the prescribed authority within such time and in such form, as may be prescribed, monthly returns showing the quantity of cotton ginned in the factory during the preceding month and from the commencement of the season to the end of that month.

(2) The officer prescribed by the Huzur in this behalf shall compile from the monthly returns submitted under section (1) and shall publish in such a manner as the Huzur may direct, from time to time, a statement showing the total quantity of cotton ginned in the State during the month and from the commencement of season to the end of the month to which the returns relate :

Provided that the quantity of cotton ginned in any individual factory shall not be published.

(3) The owner of every cotton pressing factory shall submit to the prescribed authority, within such time and in such form, as may be prescribed, weekly returns showing the total number of bales of cotton pressed during the preceding week and from the commencement of the season to the end of that week, and the approximate average net weight of the bales pressed in that week.

(4) The officer prescribed by the Huzur in this behalt shall compile the weekly returns submitted under sub-section (3) and shall publish in such manner as the Huzur may direct, a statement showing the total number of bales pressed in the State during the week and from the commencement of the season to the end of the week to which the returns relate.

Provided that the number of bales pressed in any individual factory shall not be published.

(5) If default is made in submitting any return as required by sub-section (1) or sub-section (3), the owner of the factory shall, on conviction, be punishable with fine which may extend to fifty rupees.

(6) Where the owner of a cotton ginning or cotton pressing factory has notified to the prescribed authority that the work of ginning cotton or pressing bales in that factory has been suspended, it shall not be necessary for the owner to submit returns under sub-section (1) or sub-section (3) until such work has been resumed."

9. *Amendment of section* 9.—In the last line of the sub-section (1) of section 9 of the said Act the words " for the sections 6, 7 and 8 " are substituted by " for the sections 5 *a*, 5 *b*, 5 *c*, 6, 7 and 8 " and in the sub-section (3) the words " fine extending to rupees twenty-five " are substituted by " fine extending to rupees fifty."

10. *Amendment of sub-section* (2) *of the section* 10.—In the sub-section (2) of the section 10 of the said Act the words " extend to rupees twenty-five " are substituted by " extend to rupees fifty."

11. *Amendment of sub-section* (4) *of section* 11.—In the sub-section (4 *b*) of the section 11 of the said Act the words " extending to rupees twenty-five " are substituted by " extending to rupees fifty."

12. *Introducing new section* 13 (*a*) *after section* 13.—After section 13 of the said Act, the following new section 13(*a*) is inserted :—

"13 (*a*) Notwithstanding anything contained in schedule 2 of the Criminal Procedure, a Magistrate of the First Class may pass any sentence provided for any offence under this Act."

13. *Amendment of section* 14.—In the section 14 of the said Act the following new sub-sections are inserted after (*j*) :—

" (*k*) what shall constitute an admixture of cotton ;

(*l*) the period which shall from time to time constitute a season ;

(*m*) the authority by whom, the form in which, the conditions subject to which and the fees on payment of which, a licence may be granted under sub-section (1) of the section 4 (*a*).

(*n*) the particulars of the cotton ginning factory to be entered in the register maintained under sub-section (2) of the section 5.

(*o*) the proportion of seed which may be contained in cotton ;

(*p*) the person authorised to give a certificate regarding the quantity of moisture contained in any cotton and other matters specified in section 5*a* ;

(*q*) the person authorised to examine bales under section 5*b* ;

(*r*) the procedure for making a complaint and causing the contents of a bale to be examined and the fee for examination of the contents of a bale under sub-section (1) of section 5*b* ;

(*s*) the manner in which the things seized shall be sealed under 5*c*."

14. *Addition of sections* 17 *and* 18.—After section 16 of the said Act, the following new sections 17 and 18 are added :—

"17. Whoever contravenes any of the provisions of this Act or any rules made thereunder or any of the conditions subject to which a licence has been granted to him shall on conviction, if no other penalty is already provided in this Act for such contravention, be punishable with fine which may extend to five hundred rupees or, if he has previously been convicted of an offence under this Act or any rule made thereunder, with fine which may extend to fifteen hundred rupees.

"18. (1) The District Magistrate may accept from any person whose licence is liable to be suspended, withdrawn or cancelled under this Act, or who is reasonably suspected of having committed an offence under this Act, a sum of money in lieu of such suspension, withdrawal or cancellation or by way of composition for the offence which may have been committed, as the case may be.

(2) On payment by such person of such sum to the District Magistrate, such person if in custody shall be set at liberty and if criminal proceedings shall have been instituted against such person, the composition shall be held to amount to an acquittal."

BOMBAY ACT No. XX OF 1938.

First published (after having received the assent of the Governor-General, in the "Bombay Government Gazette" on the 21st November 1938).

An Act to amend the Cotton Ginning and Pressing Factories Act, 1925, in its application to the Province of Bombay.

XII of 1925.—Whereas it is expedient to amend the Cotton Ginning and Pressing Factories Act, 1925, in its application to the Province of Bombay, for the purposes hereinafter appearing; it is hereby enacted as follows:—

1. *Short title.*—This Act may be called the Cotton Ginning and Pressing Factories (Bombay Amendment) Act, 1938.

2. *Amendment of section 3A of Act XII of* 1925.—In section 3 A of the Cotton Ginning and Pressing Factories Act, 1925, hereinafter called the said Act:—

(1) in clause (*a*) of sub-section (2) after the words "foreign substance," the words "or cotton waste" shall be inserted;

(2) sub-section (3) shall be deleted.

3. *Insertion of new section 3AA in Act XII of* 1925.—After section 3*A* of the said Act, the following new section shall be inserted:—

Penalty for making any cotton wet.—"3*AA*. Any owner of cotton who knowingly makes or causes to be made any cotton which is ginned and which is being or is intended to be pressed in a cotton pressing factory, wet, or mixes or causes to be mixed seed, foreign substance or cotton waste with such cotton, or in any area specified in sub-section (1) of section 3*A* makes any admixture of cotton, or abets or knowingly allows or connives at any such act shall, on conviction, be punishable with fine which may extend to five thousand rupees."

4. *Amendment of section 3B of Act XII of* 1925.—In section 3*B* of the said Act, after the word, figure and letter "section 3*A*," the words, figure, and letters "or section 3*AA*" shall be inserted.

APPENDIX XV

BALANCE SHEET AS ON 31ST MARCH 1939.

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Cotton Cess Receipts	1,26,57,978 13 3		I. A. Administration		*20,38,157 15 6
Less: Refunds of cess to Burma..	42,369 10 9	1,26,15,609 2 6	B. *Improvement of Cotton Marketing.*		
Interest account :—			1. Cost of exhibits, travelling allowance of representatives on the Board of the East India Cotton Association and members of the Standards Sub-Committee	1,29,029 13 7	
Amount received on Investments	19,45,512 3 0		2. Enquiry into the cost of cotton production in India	2,58,790 12 6	3,87,820 10 1
Add : Refund of income-tax from interest ..	19,393 2 0		C. *Seed Distribution and Extension Schemes :—*		
	19,64,905 5 0		(*i*) *Bombay Presidency :—*		
Less :—			(1) Hubli	44,048 8 3	
1. Interest paid in advance at the time of purchasing Govt. Paper (since recovered), interest on temporary overdrafts and bank's commission for collection of interest	57,924 15 0		(2) Gadag	41,700 15 1	
2. Interest credited to Provident Fund a/c.	4,886 6 2		(3) Gadag Supplementary ..	20,167 11 4	
3. Bank's withdrawal charges	4,755 13 0		(4) Surat	73,351 15 4	
4. Income-tax on interest on Govt. Paper ..	23,431 11 2		(5) Athani	18,086 1 7	
5. Brokerage for securities sold	828 10 0		(6) Khandesh (Banilla) ..	1,61,899 13 6	
6. Provision for Sinking Fund	11,040 5 0		(7) Khandesh (Jarila)	22,852 10 6	
	1,02,867 12 4	18,62,037 8 8	(8) Deccan Canals (Banilla) ..	3,501 6 8	
Profit on conversion and sale of Securities ..		2,50,459 10 2	(9) B.D. 8	10,364 10 0	
Sinking Fund Account		11,040 5 0	(10) Revised Jayawant	70,094 1 4	
Miscellaneous Receipts		60,552 5 8	(11) Gadag No. 1	23,340 4 3	
Refund from Provident Fund for contributions disallowed		3,391 1 11	(12) Maintenance of nucleus of seed of improved varieties of cotton	3,828 12 0	
Suspense receipts		117 13 0	(*ii*) *Madras :—*		
			(1) Pay and allowance of Business Manager, Tiruppur ..	24,079 13 0	
			(2) Co. 2	40,204 15 9	
			(3) H. I	3,952 2 9	
			(4) Maintenance of nucleus of seed of improved varieties of cotton	610 0 0	
Carried over		1,48,03,207 14 11	Carried over ..	5,62,083 13 4	24,25,978 9 7

* Includes travelling allowance for non-official members.

BALANCE SHEET AS ON 31ST MARCH 1939—(*contd.*)

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Brought forward ..		1,48,03,207 14 11	Brought forward ..	5,62,083 13 4	24,25,978 9 7
			(*iii*) *Sind* :—		
			(1) Seed Distribution	3,58,089 3 9	
			(2) Maintenance of nucleus of pure seed of improved varieties of cotton	2,500 0 0	
			(*iv*) *Hyderabad*	42,803 12 1	
			(*v*) *Central Provinces* :—		
			Extension of long staple cotton and marketing of Verum cotton	2,61,529 0 7	
			(*vi*) *Baroda*	13,978 15 10	
			(*vii*) Lyallpur (Ginnery)	16,038 3 3	
			(*viii*) *United Provinces* :—		
			C. 402	18,617 7 6	12,75,640 8 4
			D. *Printing and Propaganda.*—		
			(1) Publicity & Propaganda ..	1,56,555 15 0	
			(2) Printing & Distribution ..	78,322 3 3	2,34,878 2 3
			E. *Statistical Research.*—		
			(1) Studies of village consumption of Indian cotton ..	22,577 5 2	
			(2) Improvement of cotton Forecasts	26,396 3 6	48,973 8 8
			II. *Technological Research.*—		
			(1) *Technological Laboratory* :—		
			A. Capital Expenditure :—		
			(1) Land and Buildings ..	4,07,988 14 6	
			(2) Machinery	1,02,491 2 9	
			(3) Freight	7,502 2 8	
			(4) Apparatus & Equipment ..	41,558 3 7	
			(5) Machinery Workshop ..	5,789 8 3	
Carried over ..		1,48,03,207 14 11	Carried over ..	5,65,329 15 9	39,85,470 12 10

BALANCE SHEET AS ON 31ST MARCH 1939—(*contd.*)

RECEIPTS.	Rs.	a.	p.	Rs.	a.	p.	EXPENDITURE.	Rs.	a.	p.	Rs.	a.	p.
Brought forward ..				1,48,03,207	14	11	Brought forward ..	5,65,329	15	9	39,85,470	12	10
							B. Working Expenses	21,79,197	9	11			
							(2) Provincial	1,38,124	1	4			
							(3) Development of alternative uses for Indian cottons ..	17,048	0	11	28,99,699	11	11
							III. *Research Studentships*	2,73,425	6	10			
							Less: Refund from Mr. Taskir Ahmad	1,393	12	0	2,72,031	10	10
							AGRICULTURAL RESEARCH GRANTS.						
							IV. *Bombay* :—						
							1. A. Surat Physiological	2,45,139	11	3			
							B. ,, ,, Writing-up	5,814	7	8			
							2. A. Surat Bollworm	1,14,509	9	7			
							B. ,, ,, Propaganda ..	91,468	9	2			
							C. ,, ,, Writing-up ..	2,315	3	0			
							3. A. Dharwar Wilt	1,82,836	4	11			
							B. Dharwar Wilt Writing-up ..	10,902	10	3			
							4. Khandesh	26,573	5	0			
							5. Co-ordination of Cotton Research	1,749	7	6			
							6. Jalgaon Cotton Breeding	51,472	8	3			
							7. Broach Cotton Breeding	65,634	12	2			
							8. Small Leaf Disease Survey ..	3,938	9	6			
							9. Survey of Goghari Cotton ..	4,091	13	0			
							10. Defibration of cotton seed ..	4,878	5	9			
							11. Plant Puller Propaganda	13,513	14	9			
							12. Breeding of Wilt Resistant Cotton for Surat area	4,859	9	6			
							13. Inclusion of Northerns & Westerns at Bijapur	3,088	8	9			
							14. Poona Wilt Breeding	17,253	15	0			
							15. Extra Clerk for the Bombay Presidency Schemes	3,360	0	0			
							16. Interspecific Hybridization at Surat	1,469	8	0			
Carried over ..				1,48,03,207	14	11	Carried over ..	8,54,870	13	0	71,57,202	3	7

BALANCE SHEET AS ON 31ST MARCH 1939—(*contd.*)

RECEIPTS.	Rs.	a.	p.	Rs.	a.	p.	EXPENDITURE.	Rs.	a.	p.	Rs.	a.	p.
Brought forward ..				1,48,03,207	14	11	Brought forward ..	8,54,870	13	0	71,57,202	3	7
							V. *Madras.*—						
							1. Herbaceum	1,42,595	14	6			
							2. Pempheres & Physiological ..	1,60,742	7	7			
							3. Fodder Cholam	19,517	9	4			
							4. Breeding of Nadam Cotton ..	13,196	14	0			
							5. Improvement of Mungari Cotton	5,357	14	10			
							VI. *Punjab.*—						
							(*a*) Botanical	5,47,101	8	5			
							(*b*) Entomological	2,25,861	0	11			
							(*c*) White Fly	48,721	4	1			
							(*d*) Root Rot	48,168	15	1			
							(*e*) Spraying Trials	10,081	13	6			
							(*f*) Defibrating and Delinting ..	6,112	8	9			
							(*g*) Survey of Disease of Malformation	1,730	10	6			
							(*h*) Physiological	1,85,801	13	8			
							(*i*) Clean-up Campaign of Spotted Bollworm	50,517	10	0			
							(*j*) Jassid Investigation	6,527	14	6			
							(*k*) Improvement of Punjab-American 289F.	2,081	3	0			
							VII. *Central Provinces.*—						
							(*a*) Botanical	4,93,449	9	4			
							(*b*) Entomological	12,344	13	6			
							VIII. *United Provinces.*—						
							(*a*) Pink Bollworm	1,46,834	1	4			
							(*b*) Rohilkhand and Bundelkhand cotton survey	18,382	10	4			
							(*c*) Botanical	12,539	13	0			
							IX. Institute of Plant Industry, Indore ..	17,55,943	12	0			
							X. *Sind.*—						
							(*a*) Physiological	2,63,945	12	10			
							(*b*) Jassid Investigation	2,839	12	0			
							(*c*) Black Headed Cricket	1,940	0	0			
Carried over ..				1,48,03,207	14	11	Carried over ..	50,37,208	4	0	71,57,202	3	7

BALANCE SHEET AS ON 31ST MARCH 1939—(*contd.*)

RECEIPTS.	Rs.	a.	p.	Rs.	a.	p.	EXPENDITURE.	Rs.	a.	p.	Rs.	a.	p.
Brought forward ..				1,48,03,207	14	11	Brought forward ..	50,37,208	4	0	71,57,202	3	7
							XI. *Burma.*—						
							(*a*) Capital Expenditure	2,906	15	5			
							(*b*) Cotton Improvement	47,790	3	9			
							XII. *Hyderabad.*—						
							(*a*) Botanical	3,19,167	8	8			
							(*b*) Cotton Survey	36,578	3	0			
							(*c*) Pink & Spotted Bollworm ..	68,687	10	1			
							(*d*) Improvement of Kumpta cotton	8,598	5	1			
							(*e*) Inclusion of Northerns and Westerns at Raichur	668	0	0			
							(*f*) Pink and Spotted Bollworm Clean-up Campaign	22,914	5	0			
							XIII. Bikaner	51,834	2	2			
							XIV. *Baroda.*—						
							(*a*) Root Rot	70,992	10	6			
							(*b*) Camparative Tests	4,251	5	3			
							(*c*) Survey of Goghari Cotton ..	2,850	7	0			
							(*d*) Plant Puller Propaganda ..	19,545	5	8			
							XV. Bengal Comilla	18,246	6	9			
							XVI. Mysore Doddahathi	7,912	6	0			
							XVII. Collection of Iran cottons	3,160	0	6			
							XVIII. *Improvement of Dholleras Cottons.*—						
							(*a*) Wagad cottons at Viramgam ..	9,501	12	2			
							(*b*) Mathio Cotton at Amreli and Jagudan	6,507	10	11			
							XIX. Preliminary Scheme at Nawanagar ..	323	12	4			
							XX. Estimation of effects on cotton crop of use of Plant Puller	4,273	3	5	57,43,918	9	8
							XXI. (*a*) Punjab Cotton Marketing Survey	2,900	0	0			
							(*b*) Baroda—Better Marketing of 1027 A.L.F.	2,263	13	0	5,163	13	0
Carried over ..				1,48,03,207	14	11	Carried over ..				1,29,06,284	10	3

BALANCE SHEET AS ON 31st MARCH 1939—(*concld.*)

RECEIPTS.	Rs.	a.	p.	Rs.	a.	p.	EXPENDITURE.	Rs.	a.	p.	Rs.	a.	p.
Brought forward ..				1,48,03,207	14	11	Brought forward ..				1,29,06,284	10	3
							XXII. *Loan Recoverable (but considered doubtful) :—*						
							Hubli Co-operative Cotton Sale Society				6,966	2	0
							By Suspense account				6,832	11	0
							By Balance				18,83,124	7	8
GRAND TOTAL ..				1,48,03,207	14	11	GRAND TOTAL				1,48,03,207	14	11

PROVIDENT FUND ACCOUNT AS AT 31ST MARCH 1939.

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Subscribers' Contribution account	3,05,543 2 2		By Advance to Subscribers	51,269 2 0	
Less—Payments made to subscribers resigned ..	87,163 11 2		*Less*—Recoveries made up to 31-3-1939 ..	47,654 4 0	
	2,18,379 7 0	2,18,379 7 0			3,614 14 0
Committee's Contribution account	2,98,375 6 11		Accrued Interest on Govt. paper upto 31-3-1939 credited to subscribers for distribution ..		4,723 2 8
Less—Payments made to subscribers resigned, and forfeitures for Committee's Contributions disallowed	84,100 13 10		By Balance		4,53,285 11 5
	2,14,274 9 1	2,14,274 9 1			
Suspense Deposit of Mr. Dutt's own contribution		1,164 10 1			
Investment Fluctuation account		22,906 13 5			
Lapse and Forfeiture account		2,890 11 7			
Suspense Receipts for amount due to the subscriber's resigned.					
(1) Shankar Hari	402 5 0				
(2) Ahmed Din	261 1 3				
(3) Bhagatram Sayal	823 15 10				
(4) Rajaram Sayaji	525 2 10	2,012 8 11			
TOTAL ..		4,61,628 12 1	TOTAL ..		4,61,628 12 1

STATEMENT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 31ST MARCH 1939.

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
*Opening Balance ..		21,11,184 5 8	Administration of the Committee (including Improvement of Cotton Marketing, Seed Distribution and Extension Schemes, Printing and Propaganda, Statistical Research, and Travelling Allowance of Non-Official Members)		3,47,981 8 1
Receipts under Section 12 of the Indian Cotton Cess Act, 1923 ..		6,47,922 10 8	Agricultural Research Grants in Aid (including Marketing Schemes) ..		4,26,843 0 5
**Other Receipts ..		8,194 5 2	Technological Research		1,92,866 6 5
Interest on Investments.		97,312 14 1	Closing Balance :—		
			(Government Paper at Cost) 3½% Government of India Loan 1947-50 of the Face Value of Rs. 2,75,000	2,18,032 13 0	
			*4% Government of India Loan 1960-70 of the Face Value of Rs. 6,43,900	5,08,409 4 10	
			4½% Government of India Loan 1955-60 of the Face Value of Rs. 26,600	25,004 0 0	
			5% Government of India Loan 1939-44 of the Face Value of Rs. 64,000	35,987 15 6	
			5% Government of India Loan 1940-43 of the Face Value of Rs. 90,000	3,23,550 0 0	
			6% Bombay Municipal Bonds 1954 of the Face Value of Rs. 10,000..	3,950 0 0	
			6% Karachi Port Trust Coupon Debentures 1956 of the Face Value of Rs. 1,30,000	1,41,212 8 0	
			6% Rangoon Municipal Debentures 1955 of the Face Value of Rs. 3,83,500	4,15,328 2 0	
			3½% Indian Sterling Bearer Bonds of the Face Value of £20,000 ..	2,20,688 14 10	
				18,92,163 10 2	
			(Market Value on 31st March 1939, Rs. 22,74,335-10-4.)	..	
			* (An overdraft of Rs. 13,384-7-6 with the Imperial Bank of India has been secured against the hypothecation of 4% Government of India Loan 1960-70 of the Face Value of Rs. 1,16,900.)		
Carried over ..		28,64,614 3 7	Carried over ..		9,67,690 14 11

*Includes Rs. 9,626-11-0 on account of Sinking Fund Rs. 10,480-13-2 against Loans Recoverable from Hubli and Gadag Co-operative Cotton Sale Societies.

**Includes Rs. 1,413-10-0 against Provision for Sinking Fund for the year 1938-39 and Rs. 100-5-0 on account of undisbursed pay of the Secretary's Office Staff on leave.

STATEMENT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 31ST MARCH 1939—(*concld.*)

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Brought forward ..		28,64,614 3 7	Brought forward ..		9,67,690 14 11
			Imprest :—Committee's Account as certified by the Secretary 1,500 0 0		
			Technological Research Laboratory, as certified by the Director, Technological Research Laboratory 500 0 0		
			Director of Agriculture, Bombay Presidency as certified by the Director of Agriculture, Bombay Presidency .. 1,655 0 0		
			Director of Agriculture, Punjab, for Cotton Research Botanist, Lyallpur, as certified by the Cotton Research Botanist, Lyallpur 150 0 0		
			Plant Physiologist, Punjab, as certified by the Plant Physiologist, Punjab 100 0 0		
			Director of Agriculture, Sind 340 0 0		
			Undisbursed Pay of Staff on Leave of the Indian Central Cotton Committee 100 5 0	4,345 5 0	
				18,96,508 15 2	9,67,690 14 11
			Suspense (Recoverable)	6,832 11 0	
			Loans Recoverable (but considered doubtful)	6,966 2 0	
				19,10,307 12 2	
			Less :—Overdraft Account with the Imperial Bank of India, Bombay, (against hypothecation of 4% Government of India Loan 1960-70 of the Face Value of Rs. 1,16,900)	13,384 7 6	
			* Total Closing Balance		18,96,923 4 8
			TOTAL ..		28,64,614 3 7
TOTAL ..		28,64,614 3 7	**Includes Rs. 11,040-5-0 on account of Sinking Fund.		

We have examined the above statement of Receipts and Payments of the Indian Central Cotton Committee with the Books, Vouchers and Certified Returns of the Committee, have obtained all the information and explanations we have required and certify that to the best of our information and explanations received, the above Statement is a correct abstract of the figures appearing in the Books and is drawn up in conformity with the Rules under the Indian Cotton Cess Act, 1923.

(Sd.) S. B. BILLIMORIA & Co.,
Registered Accountants, Auditors.

BOMBAY, *26th May*, 1939.

PROVIDENT FUND ACCOUNT AS AT 31ST MARCH 1939.

RECEIPTS.	Rs. a. p.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
To Opening Balance as on 1st April, 1938 ..	4,31,223 12 7			By Investment Fluctuation Account :—		
Less—Payments to subscribers who resigned in 1937-38	2,518 0 9			Depreciation in Market Value of Securities		14,877 12 0
		4,28,705 11 10		By Balance :—		
To Subscribers' Contributions	29,606 5 0			(Securities in Government Papers at Market Price.)		
Add—Recoveries against advances	4,547 9 0					
		34,153 14 0		3½% Government Promissory Notes of the Face Value of Rs. 2,35,400	2,20,393 4 0	
		4,62,859 9 10				
To *Less*—Refunds to Subscribers who have resigned	19,123 12 0			3½% Government of India Loan 1947-50 of the Face Value of Rs. 80,500	83,569 1 0	
Advances to Subscribers	4,668 8 0			4% Government of India Loan 1960-70 of the Face Value of Rs. 32,600	35,717 6 0	
		23,792 4 0				
		4,39,067 5 10		5% Government of India Loan 1939-44 of the Face Value of Rs. 69,100	69,618 4 0	
To Committee's Contributions received from Indian Central Cotton Committee at 100 per cent.		29,606 5 0		Savings Bank Account with the Imperial Bank of India ..	1,197 7 0	
		4,68,673 10 10		Current Account with the Imperial Bank of India	42,790 5 5	
Less—Payments made to Subscribers who have resigned including transfers to "Lapses and Forfeitures" Account for contributions disallowed		18,527 12 8				4,53,285 11 5
			4,50,145 14 2			
To Interest received on Investments	15,864 2 0					
Interest received on Advances to Subscribers ..	576 15 5					
Refund of Income-tax deducted on Interest received during 1937-38	154 0 0					
		16,595 1 5				
Less—Interest paid during the year to Subscribers who have resigned; on their own Contributions	145 10 11					
On Committee's Contributions	142 4 2					
Interest paid in advance at the time of purchase of Government Securities (since received) ..	371 6 6					
Carried over ..			4,50,145 14 2	Carried over ..		4,08,163 7 5

PROVIDENT FUND ACCOUNT AS AT 31ST MARCH 1939.

RECEIPTS.	Rs. a. p.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Brought forward ..			4,50,145 14 2	Brought forward ..		4,68,163 7 5
Income Tax deducted from Interest on Investments (recoverable)	242 0 8					
Bank's Commission for collection of Interest and cost of stamps	30 15 0					
Cost of Stationery	23 12 0					
		956 1 3	15,639 0 2			
To Lapses and Forfeitures Account			366 0 2			
To Suspense Receipts, amount due to subscribers resigned but remained unpaid during the year :—						
Mr. Shankar Hari		402 5 0				
Mr. Ahmad Din		261 1 3				
Mr. Bhagatram Sayal		823 15 10				
Mr. Raja Ram Sayaji		525 2 10				
			2,012 8 11			
TOTAL ..			4,68,163 7 5	TOTAL ..		4,68,163 7 5

*Includes Rs. 1,164-10-1, being Suspense Deposit with Interest thereon of Mr. Dutt's own contribution.

Examined and found correct.

(Sd.) S. B. BILLIMORIA & Co.,

Registered Accountants, Auditors.

BOMBAY, 26*th May* 1939.

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31ST MARCH 1939.

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1939.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
II. Technological Research :—									
(1) Technological Laboratory :—									
(*a*) Capital Expenditure ..	5,82,399 3 8	Permanent.	1923	5,65,329 15 9	407,988 14 6	1,57,341 1 3	..	..	
(*b*) Working Expenses ..	22,23,235 15 7		Jan. 1924	21,79,197 9 11	..	..	56,222 5 8	21,22,975 4 3	
(2) Provincial :—									
Capital	8,211 0 0		April 1928.	1,38,124 1 4	..	*7,515 15 7	..	..	* Provisional figure.
Working	1,30,608 1 9		..	..	..	..	714 8 9	1,29,893 9 0	
(3) Development of alternative uses for Indian cottons	40,263 0 0	..	..	17,048 0 11	..	..	..	17,048 1 11	
Agricultural Research Grants.									
IV. Bombay Schemes :—									
(1) Surat Physiological and Writing-up	2,91,445 0 0	10 1½	Sept. 1923	2,50,954 2 11	..	..	23,334 5 2	2,27,619 13 9	Physiological scheme closed down on 4th August 1932 and Writing-up scheme on 17th October 1933.
(2) (*a*) Surat Bollworm ...	1,20,720 0 0	7 7	Sept. 1923.	1,14,509 9 7	..	..	4,707 8 7	1,09,802 1 0	Scheme closed down on 31st March 1931.
(*b*) Surat Bollworm Writing-up.	2,420 0 0	0 4	July 1932.	2,315 3 0	..	..	..	2,315 3 0	
(*c*) Surat Bollworm Propaganda and Clean-up	1,28,764 0 0	4 0	1st April 1931	91,468 9 2	..	..	10,828 0 11	80,640 8 3	

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31ST MARCH 1939—(*contd.*)

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1939.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
IV. Bombay Schemes :—contd.	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
(*d*) Plant Puller Propaganda Scheme in Surat, Broach, and Panch-Mahal Districts.	42,524 0 0	7 0	March 1934	13,513 14 9	..	..	817 12 6	12,696 2 3	This continuation scheme is financed from the savings of the Surat Clean-up Scheme.
(3) Dharwar :—									
(*a*) Wilt and Cotton Breeding	2,63,545 0 0	8 11	Sept. 1923	1,82,836 4 11	..	..	13,713 3 7	1,69,123 1 4	Schemes closed down on 31st July 1932 and in July 1929.
(*b*) Writing-up	11,355 0 0	0 10	1st June 1932	10,902 10 3	..	..	..	10,902 10 3	Scheme closed down on 31st March 1933.
(4) Khandesh Cotton Breeding.	27,995 0 0	5 5½	15th Oct. 1926	26,573 5 0	..	..	..	26,573 5 0	Scheme closed down on 31st March 1932.
(5) Co-ordination of Cotton Research	23,991 0 0	..	not started.	1,749 7 6	..	..	..	1,749 7 6	
(6) Jalgaon Cotton Breeding ..	76,061 0 0	10 0	1st April 1932	51,472 8 3	..	..	3,908 0 0	47,564 8 3	
(7) Broach Cotton Breeding ..	1,20,910 0 0	10 0	1st April 1932	65,634 12 2	..	..	6,676 2 8	58,958 9 6	
(8) Survey of Small Leaf disease of cotton	5,118 0 0	1 0	6th Nov. 1933	3,938 9 6	..	..	495 2 6	3,443 7 0	Scheme closed down on 31st October 1934.
(9) Survey of Goghari cotton in Gujerat	5,000 0 0	5 0	16th Jan. 1935.	4,091 13 0	..	..	..	4,091 13 0	Scheme closed down on 31st March 1939.

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31ST MARCH 1939—(*contd.*)

MAJOR HEADS.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1939.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	REMARKS.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
IV. Bombay Schemes—contd.	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
(10) Defibrating of cotton seed–									
(*a*) Recurring	5,250 0 0	3 0	1st Feb. 1936.	4,878 5 9	..	..	39 10 1	1,141 3 10	
(*b*) Non-Recurring ..	3,700 0 0				..	3,697 7 10	..	..	
(11) Breeding of Wilt Resistant Cottons for Surat area ..	14,385 0 0	5 7	1st April 1937.	4,859 9 6	..	..	245 0 6	4,614 9 0	
(12) Cotton Wilt Breeding Scheme, Poona	42,350 0 0	5 0	1st April 1937.	17,253 15 0	..	..	4,206 1 5	13,047 13 7	
(13) Inclusion of Northerns and Westerns in Dry Farming scheme at Bijapur.. ..	7,908 0 0	4 0	1st June 1937	3,088 8 9	..	..	972 15 9	2,115 9 0	
(14) Inter-specific Hybridisation in cottons at Surat ..	14,014 0 0	5 0	1st Nov. 1938	1,469 8 0	..	..	650 0 0	819 8 0	
(15) Improvement of Cotton crop in Kaira District ..	13,880 0 0	5 0	..	..	..	..	..	..	
V. Madras:—									
(*a*) Herbaceum	1,47,068 0 0	14 6	1st Dec. 1923	1,42,595 14 6	..	..	4,431 7 0	1,38,164 7 6	Scheme closed down on 31st May 1938.
(*b*) Pempheres and Physiological	2,12,779 0 0	10 0	16th Sept.1931	1,60,742 7 7	..	..	8,114 10 10	1,52,627 12 9	
(*c*) Fodder Cholam :—									
(i) Capital	900 0 0	6 5	14th Jan. 1931	19,517 9 4	..	881 11 7	..	..	
(ii) Recurring	21,010 0 0				..	..	291 3 4	18,344 10 5	Scheme closed down on 14th June 1937.
(*d*) Nadam Cotton Breeding	18,203 0 0	8 0	14th June 1933	13,196 14 0	..	..	411 12 9	12,785 1 3	

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31ST MARCH 1939—(*contd.*)

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1939.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
V. Madras :—contd. ..									
(*e*) Improvement of Mungari cotton	23,534 0 0	5 0	24th May 1937	5,357 14 10	..	..	239 7 2	5,118 7 8	
(*f*) Improvement of Coconadas Cotton	35,309 0 0	5 0	..	..	..	..	..	..	
(*g*) Investigation of possibilities of Control of Cotton Stem Weevil of South India	5,500 0 0	1 0	..	..	..	..	..	..	
VI. Punjab :—									
(*a*) Botanical :—									
(i) Capital	31,330 0 0	14 7½	13th Aug. 1925	5,47,101 8 5	22,158 0 0	9,102 11 0	..	..	*Rs. 2,030 transferred to Capital.
(ii) Working Expenses	*6,85,650 0 0				..	..	35,757 5 1	4,80,083 8 4	
	20,860 0 0	2 0							
(*b*) Entomological :—									
(i) Capital	6,000 0 0	11 11	4th May 1926	2,25,861 0 11	..	5,826 3 10	..	..	Scheme closed down on 31st March 1938.
(ii) Working Expenses (Pink and Spotted Bollworm)	2,49,646 0 0				..	..	8,992 8 11	2,11,042 4 2	
(*c*) White fly	56,087 0 0	5 5	1st May 1931	48,721 4 1	..	..	6,762 15 0	41,958 5 1	Scheme closed down on 30th September 1936.
(*d*) Root Rot :—									
(i) Non-Recurring ..	3,000 0 0	8 6	1st Sept. 1932	48,168 15 1	..	..	377 10 0	47,791 5 1	
(ii) Recurring	63,391 0 0								
(*e*) Spraying Trials	14,400 0 0	..	8th July 1933	10,081 13 6	..	..	2,372 2 3	7,709 11 3	

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31ST MARCH 1939—(*contd.*)

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1939.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
VI. Punjab :—contd.	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
(*f*) Physiological (Cotton Failure Research)	2,36,348 0 0 *1,39,386 0 0	5 0 3 0	15th March 1935	1,85,801 13 8	..	..	20,529 7 5	1,65,272 6 3	* Subject to Government of India sanction.
(*g*) Clean-up Campaign	52,580 0 0	2 0	1st April 1937	50,517 10 0	..	..	9,896 12 8	40,620 13 4	
(*h*) Defibrating & Delinting :— Recurring Non-recurring	1,000 0 0 6,700 0 0	2 0	..	6,112 8 9	.. ..	5,872 10 0	17 12 0 ..	222 2 9 ..	
(*i*) Survey of disease of malformation	2,674 0 0	0 10	1st June 1934	1,730 10 6	..	..	..	1,730 10 6	Scheme closed down on 31st March 1935.
(*j*) Cotton Jassid Investigation	10,225 0 0	3 0	1st April 1937	6,527 14 6	..	..	320 5 9	6,207 8 9	
(*k*) Improvement of Punjab American 289F Cotton	14,000 0 0	5 0	9th July 1938	2,081 3 0	..	..	30 10 0	2,050 9 0	
VII. Central Provinces and Berar :—									
(*a*) Botanical †	61,000 0 0 6,04,442 0 0	2 6 18 0	October 1923 1st April 1926	4,93,449 9 4	..	..	5,122 13 4	4,88,326 12 0	The balance of this amounting to Rs. 3,100-13-5 lapsed on revision. †New nomenclature from 1st April 1939, C. P. and Berar Cotton Breeding Schemes.

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31ST MARCH 1939—(*contd.*)

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1939.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
VII. Central Provinces and Berar :—contd.	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
(*b*) Entomological	13,131 0 0	3 3	2nd July 1934	12,344 13 6	..	..	59 10 6	12,285 3 0	Scheme closed down on 30th September 1937.
(*c*) Investigation of Heliothis Obsoleta	3,000 0 0	1 0	1st April 1939	..	..	..	..	..	
VIII. United Provinces :—									
(*a*) Pink Bollworm :—									
i. Capital	54,000 0 0	8 0	July 1923	1,46,834 1 4	..	49,511 5 6	3,065 4 3	95,257 7 7	Scheme closed down on 31st July 1931.
ii. Working Expenses	56,000 0 0				..	..			
iii. Recurring grant for Staff	44,475 0 0	7 9½	1st Oct. 1926	..	..	..	..	..	Scheme closed down on 12th July 1934.
(*b*) Rohilkhand and Bundelkhand Cotton Survey.	19,000 0 0	3 8	1st July 1933	18,382 10 4	..	..	1,529 12 1	16,852 14 3	Scheme closed down on 1st March 1937.
(*c*) Botanical	91,380 0 0	5 0	22nd Aug. 1933	12,539 13 0	..	..	4,542 11 0	7,997 2 0	
IX. Institute of Plant & Industry Indore :—									
(*a*) Capital	*2,83,535 12 10	Permanent.	Oct. 1924	17,55,943 12 0	2,12,552 11 5	70,983 1 5	31,857 4 4	14,40,550 10 10	* Rs. 50,202-12-10 transferred from recurring grant to capital.
(*b*) Working Expenses ..	13,72,407 15 2			..	..	..			

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31ST MARCH 1939—(*contd.*)

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1939.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
X. Sind :—									
(i) Physiological	2,74,346 0 0	11 4	10th July 1927	2,63,945 12 10	..	..	17,370 11 9	2,46,575 1 1	Scheme closed down on 30th June 1937.
(ii) Jassid Investigation ..	11,261 0 0	3 6	9th May 1938	2,839 12 0	..	..	..	†2,839 12 0	
(iii) Investigation into Black-headed Cricket ..	13,980 0 0	3 0	30th Sept. 1938	1,940 0 0	..	..	..	†1,940 0 0	
(iv) Cotton Breeding Investigation for the production of long staple cottons for cultivation in Sind	2,21,140 0 0	5 0	..	..	..	..	..	..	
XI. Burma :—									
(*a*) Capital	3,000 0 0	.. ..	..	2,906 15 5	..	2,906 15 5	..	..	
(*b*) Cotton Improvement ..	49,032 0 0	6 0	1st April 1931	47,790 3 9	..	..	4,234 5 0	43,555 14 9	Scheme closed down on 31st March 1937.
XII. Hyderabad :—									
(*a*) Botanical	4,92,969 0 0	14 11	10th May 1929	3,19,167 8 8	..	..	†19,760 14 2	†2,99,406 10 6	
(*b*) Cotton Survey	39,165 0 0	5 0	28th June 1931	36,578 3 0	..	..	187 11 10	36,390 7* 2	Scheme closed down on 27th June 1936.
(*c*) Pink and Spotted Bollworm and Clean-up Campaign	1,21,600 0 0 29,418 0 0	6 4 1 6	1st June 1933	91,601 15 1	..	..	†828 5 1	†90,773 10 0	
(*d*) Improvement of Kumpta cotton	32,542 0 0	5 0	28th Nov. 1937	8,598 5 1	..	..	†179 12 10	†8,418 8 3	† Provisional figure.
(*e*) Inclusion of Northern & Western in Dry Farming Scheme at Raichur.	1,723 0 0	4 0	1st Sept. 1937	668 0 0	..	..	..	668 0 0	

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31ST MARCH 1939—(*contd.*)

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1939.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
XIII. Bikaner—Bengals Cotton Improvement:—									
(*a*) Capital	14,500 0 0	10 0	1st Jan. 1931	51,834 2 2	8,584 6 9	3,873 13 3	*1,263 6 0	*38,112 8 2	
(*b*) Working	65,320 0 0								
XIV. Baroda:—									
(*a*) Root Rot—									
i. Capital	4,000 0 0								
ii. Recurring Expenses	91,569 0 0	10 4	1st Feb. 1932	70,992 10 6	3,046 1 7		*5,442 3 4	*62,504 5 7	
(*b*) Comparative tests of 1027 and *Ia* cottons	4,280 0 0	1 2	1st April 1932	4,251 5 3			145 11 6	4,105 9 9	Scheme closed down on 15th June 1933.
(*c*) Survey of Goghari Cotton	5,000 0 0	5 0	1st Feb. 1935	2,850 7 0				2,850 7 0	Scheme closed down on 31st May 1938.
(*d*) Plant Puller Propaganda	27,753 0 0 14,100 0 0	4 0 2 0	1st Jan. 1936	19,545 5 8			585 14 0	18,959 7 8	
XV. Bengal Comilla Cotton	24,043 0 0 14,615 0 0	5 4 2 0	1st Dec. 1934	18,246 6 9			*967 11 4	*17,278 11 5	*Provisional figure.
XVI. Mysore (Doddahathi) Cotton	18,416 0 0	6 0	1st Nov. 1935	7,912 6 0			60 3 0	7,852 3 0	
XVII. Collection of Herbaceum Cottons in Iran	4,000 0 0		31st Aug. 1936	3,160 0 6				3,160 0 6	
XVIII. Improvement of Dholleras:									
(*a*) Preliminary trials at Nawanagar	900 0 0	0 4	1st June 1936	323 12 4				323 12 4	
(*b*) Wagad cotton at Viramgam	27,110 0 0	5 0	1st May 1937	9,501 12 2			1,395 10 11	8,106 1 3	

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31st MARCH 1939—(*contd.*)

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1939.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
(*c*) Mathio cotton at Amreli and Jagudan	21,570 0 0	5 0	4th June 1937	6,507 10 11	..	..	535 7 4	5,972 3 7	
XIX. Baluchistan :—									
Co-ordination of Research Works on Black-headed Cricket in Sind and Baluchistan	3,920 0 0	2 0	..	..	..	..	..	..	
XX. Cutch :—									
Improvement and Development of cotton	40,790 0 0	5 0	..	..	..	..	..	..	
XXI. Estimation of effects on cotton crop of use of Plant Pullers.	4,738 0 0	2 0	1st Dec. 1936	4,273 3 5	..	..	2 4 0	4,270 15 5	Scheme closed down on 31st May 1938.
XXII. Marketing Schemes :—									
(*a*) Marketing of 1027 A.L.F. Cotton of Baroda State	7,326 0 0	3 0	1st Feb. 1938	2,263 13 0	..	..	..	2,263 13 0	
(*b*) Cotton Marketing Survey in the Punjab ..	7,634 0 0	1 3	16th Sept. 1938	2,900 0 0	..	..	79 9 0	2,820 7 0	

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31st MARCH 1939—(*contd.*)

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1939.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
				SEED SCHEMES.					
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
1. *Bombay Province :—*									
i. Hubli	50,110 0 0	6 0	June 1930	44,04£ 8 3	..	..	5 14 0	44,042 10 3	Schemes closed down on 31st May 1936.
ii. Gadag	54,545 0 0	6 0	June 1930	41,700 15 1	..	..	..	41,700 15 1	
iii. Gadag Supplementary ..	21,448 0 0	4 0	10th June 1931	20,167 11 4	..	..	2,929 5 6	17,238 5 10	Scheme closed down on 10th June 1935.
iv. Haveri	27,752 0 0	5 0	..	..	..	..	..	..	Scheme did not start.
v. Athani	46,757 0 0	5 0	5th April 1932	18,086 1 7	..	..	1,722 15 6	16,363 2 1	Scheme closed down on 31st May 1936.
vi. Bailhongal	27,425 0 0	5 0	..	..	..	..	..	..	Scheme did not start.
vii. Surat									
(*a*) 1027 A.L.F. ..	1,18,410 0 0	10 0	1st April 1930	73,351 15 4	..	..	..	73,351 15 4	
(*b*) Selection 1A Cotton	7,272 0 0	3 0							
viii. Khandesh (Banilla) ..	2,70,340 0 0	5 0	1st May 1931	1,61,899 13 6	..	..	9,032 14 0	1,52,866 15 6	Receipts amounting to Rs. 1,10,000 anticipated in the scheme. The grant of Rs. 20,787 for the extended period takes into account anticipated receipts amounting to Rs. 6,000. This scheme closed down on the 30th April 1937.
	20,787 0 0	1 0							
ix. Khandesh (Jarila) ..	24,828† 0 0	1 10	1st May 1937	22,852 10 6	..	2,970 0 0	*605 12 6	19,276 14 0	† Excludes anticipated receipts amounting to Rs. 6,500.
	77,297 0 0	3 0							
									* Provisional figure.

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1939.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
x. Deccan Canals (Banilla) ..	‡24,465 0 0 1,313 0 0	5 0 5 0	1st April 1934	3,501 6 8	...	..	111 1 6	3,390 5 2	‡ This scheme is self-supporting due to the anticipated receipts.
xi. B.D. 8	47,501 0 0	8 0	1st Dec. 1935	10,364 10 0	..	..	217 9 6	10,147 0 6	* Provisional figure.
xii. Revised Jayawant and Gadag No. I	2,66,772 0 0	5 0	1st June 1936	70,694 1 4 23,340 4 3	..	..	1,864 15 0 *68 6 0	68,229 2 4	This grant is subject to the condition that the Bombay Government bears 25% of the net cost calculated after deducting total savings under the Hubli Gadag, Athani, Haveri and Bailhongal schemes.
xiii. Maintenance of nucleus of pure seed of improved varieties of cotton ..	13,300 0 0	5 0	Sept. 1937	3,828 12 0	..	..	14 12 0	3,814 0 0	
2. *Madras :—*									
i. Pay and allowance of Business Manager, Tirupur ..	24,940 0 0	6 4	18th May 1931	24,079 13 0	..	..	162 4 0	23,917 9 0	Scheme closed down on 17th August 1937.
ii. Co. 2	81,310† 0 0 63,357 0 0	6 0 4 5	15th Sept. 1932	40,204 15 9	..	..	83 13 0	40,121 2 9	† Scheme closed down on 17th August 1937 and recommenced from 19th October 1938 for one year's extension.

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31st MARCH 1939—(*contd.*)

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1939.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
2. *Madras*—(contd.)	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
iii. H. 1	18,860 0 0	2 0	6th May 1933	3,952 2 9	..	..	..	3,952 2 9	Scheme closed down on 16th July 1934.
iv. Maintenance of nucleus of pure seed of improved varieties of cotton ..	3,050 0 0	5 0	12th Sept. 1938	610 0 0	..	..	..	610 0 0	
3. Punjab Lyallpur Ginnery ..	18,125 0 0	..	..	16,038 3 3	9,221 5 0	6,816 14 3	..	..	
4. *Sind* :—					..				
i. Seed Distribution and Extension scheme	4,34,202 0 0	10 0	1st April 1931	3,58,089 3 9	..	..	†6,832 13 6	3,51,256 6 3	† Provisional figure.
ii. Maintenance of nucleus of pure seed of improved varieties of cotton ..	12,500 0 0	5 0	1st April 1938	2,500 0 0	..	..	..	2,500 0 0	
iii. Financing of seed distribution	1,35,000 0 0	3 0	..	..	..	..	..	..	To start from 1939-40.
5. Hyderabad State—Seed Distribution and Extension Scheme	35,466 0 0 *b.* 25,799 0 0	6 6 4 6	1st March 1930	42,803 12 1	..	..	..	*42,803 12 1	*Provisional figure. *b.* The amount represents the Committee's share of expenditure which is borne on 50 : 50 basis between the Hyderabad State and the Committee.

STATEMENT SHOWING EXPENDITURE UNDER RESEARCH AND SEED EXTENSION SCHEMES UP TO 31st MARCH 1939—(*concld.*)

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March 1939.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p	Rs. a. p.	
6. *Central Provinces and Berar :—*									
i. Verum cotton	1,17,900 0 0	3 8	1st Sept. 1930	73,544 2 5	..	..	..	73,544 2 5	Scheme closed down on 30th April 1934.
ii. Extension of long staple cotton and marketing of Verum cotton (New nomenclature from 1st March 1939—Extension and Marketing of V. 434).	2,18,819 0 0 33,725 0 0	5 2½ 3 0	1st April 1934	1,87,984 14 2	..	..	330 0 0	1,87,654 14 2	
iii. Distribution and Marketing of Buri 107 cotton in Burhanpur Tahsil ..	15,300 0 0	3 0	April 1939	..	..	..	..	..	
iv. Maintenance of nucleus of pure seed of improved strains of cotton ..	7,000 0 0	5 0	April 1939	..	..	..	..	..	
7. *Baroda State :—*									
i. Navsari Seed Storage Scheme	55,488 0 0	10 0	16th April 1934	13,978 15 10	..	..	*117 8 0	*13,861 7 10	* Provisional figure.
ii. B.D. 8	17,300 0 0	5 0	1st April 1939	..	..	..	..	..	
8. United Provinces C. 402 ..	45,800 0 0	5 0	1st May 1935	18,617 7 6	..	..	300 0 0	18,317 7 6	Closed down on 15th February 1938.

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE UP TO THE 31ST MARCH 1939.

Provinces and Indian States, etc.	Agricultural Research Schemes.	Seed Distribution and Extension Schemes.	Marketing Survey Schemes.	Remarks.
	Rs. a. p.	Rs. a. p.	Rs. a. p.	
Bombay	8,68,645 12 7	4,93,236 13 10	....	
Madras	3,41,410 12 3	68,846 15 6	....	
Bengal	18,246 6 9	....	....	
Punjab	11,32,706 6 5	16,038 3 3	2,900 0 0	
United Provinces	1,77,756 8 8	18,617 7 6	....	
Central Provinces and Berar	5,05,794 6 10	2,61,529 0 7	....	
Sind	2,68,725 8 10	3,60,589 3 9	....	
Burma	50,697 3 2	....	....	
Institute of Plant Industry, Indore ..	17,55,943 12 0	....	....	
Hyderabad	4,56,613 15 10	42,803 12 1	....	
Mysore	7,912 6 0	....	....	
Baroda	1,04,147 7 4	13,978 15 10	2,263 13 0	
Bikaner	51,834 2 2	....	....	
Nawanagar	323 12 4	....	....	Improvement of Dholleras Cotton—Preliminary Scheme at Nawanagar.
Iran	3,160 0 6	....	....	Collection of Iran cottons.
Total ..	57,43,918 9 8	12,75,640 8 4	5,163 13 0	

APPENDIX XVI.

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1939.

1.	Secretary	Mr. D. N. Mahta, B.A., (Oxon).	——
2.	Assistant Secretary	Mr. C. J. Bocarro, M.A.	——
3.	Superintendent	Mr. Ajodhya Sahai	——
4.	Statistical Assistant	Mr. M. S. Natesan, M.A.	——
		TECHNOLOGICAL LABORATORY, BOMBAY.	
5.	Director	Dr. Nazir Ahmad, O.B.E., M.Sc., Ph.D. (Cantab.), F. Inst. P.	Late Head of Science Department, Islamia College, Lahore.
6.	Senior Research Assistant (Chemist)	Mr. D. L. Sen, M.Sc., Tech. (Manch.), M.Sc. (Bom.), A.I.I.Sc., F.I.C.	Research Student at the Indian Institute of Science and Manchester College of Technology.
7.	Senior Research Assistant (Physicist)	Mr. N. Hari Rao, M.Sc. (Calcutta)	Research Scholar, Technolcgical Laboratory (Textile Physics).
8.	Senior Research Assistant (Physicist)	Mr. Ram Saran Koshal, M.Sc., (Punjab)	Do. do.
9.	Spinning Master	Mr. V. V. Gupte, B.Sc., (Tech.) (Man.).	——
10.	Junior Research Assistant (Microscopist)	Mr. Amar Nath Gulati, M.Sc. (Punjab)	Imperial Institute of Veterinary Research, Muktesar, U. P.
11.	Statistician and Personal Assistant	Mr. V. Venkataraman, M.A. (Madras)	Statistical Assistant, Labour Office, Govt. of Bombay, Bombay.
12.	Junior Research Assistant (Physicist)	Mr. C. Nanjundayya, M.Sc. (Calcutta)	Research Scholar, Technological Laboratory (Textile Physics).
13.	Junior Research Assistant (Physicist)	Mr. Srinagabhushana, B.Sc. (Mysore)	Research Scholar, Technological Laboratory (Textile Physics).

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1939—*contd.*

TECHNOLOGICAL LABORATORY, BOMBAY—*contd.*

14.	Senior Tester	Mr. H. B. Joshi, B.Sc.	——
15.	Senior Tester	Mr. S. S. Sukthanker, L.T.C. (V.J.T.I.)	——
15.	Junior Tester	Mr. G. D. Bhide, B.Sc.	——
16.	Junior Tester	Mr. K. V. N. Nayar	——
17.	Junior Tester	Mr. V. N. Modak, B.Sc.	——
18.	Junior Tester	Mr. L. V. Sundararaman, B.A.	——
19.	Junior Tester	Mr. P. S. Sambamurthy	——
20.	Junior Tester	Mr. R. G. Panvalkar, B.Sc.	——
21.	Junior Tester	Mr. G. J. Kharkar, B.Sc.	——
22.	Junior Tester	Mr. A. J. Farid	——
23.	Junior Tester	Mr. P. V. Nachane, B.Sc.	——
24.	Junior Tester	Mr. S. Samson, B.Sc.	——
25.	Junior Tester	Mr. C. S. Ramanathan, B.Sc.	——
26.	Junior Tester	Mr. B. N. Prabhakar, B.Sc.	——
27.	Junior Tester	Mr. S. M. Nawaz, B.Sc.	——
28.	Junior Tester	Mr. S. B. Mogre, M.Sc.	Research Scholar, Institute of Plant Industry, Indore.
29.	Junior Tester	Mr. P. D. Vakil	——
30.	Statistical Clerk	Mr. R. Krishna Iyer	——

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1939—*contd.*

TECHNOLOGICAL LABORATORY, BOMBAY—*contd.*

31.	Statistical Clerk	Mr. P. K. Wagle		——
32.	Electrician	Mr. H. Lobo, L.E.E. (V.J.T.I.)		——
33.	Spinning Assistant	Mr. N. Iyengar		——
34.	Draughtsman	Mr. B. G. Mehta		——
35.	Mechanic	Mr. J. B. Kharas		——

INSTITUTE OF PLANT INDUSTRY, INDORE.

36.	Director	Mr. T. R. Low, B.Sc., (Agri.) (London), I.A.S.	Principal, Agricultural College, Cawnpore. On deputation from the United Provinces Department of Agriculture.	
37.	Geneticist and Botanist	Mr. K. Ramiah, M.B.E., L.Ag., M.Sc. Dip. Agri. (Cantab.).	Paddy Specialist to the Madras Government. On deputation from the Madras Department of Agriculture.	
38.	Chemist and Agronomist	Mr. Y. D. Wad, M.A., M.Sc. (Bombay), A.I.I.Sc.	Research Student, Indian Central Cotton Committee.	
39.	Head Assistant, Chemistry and Agronomy Section.	Mr. A. Sreenivasan, M.A., D.Sc. (Madras), A.I.C.	Research Biochemist in I.C.A.R. Scheme (Bangalore).	
40.	Farm Superintendent	Mr. C. G. Tambe, B.Ag. (Bombay)	——	
41.	Extension Officer	Mr. Kuber Singh, B.Ag. (Bombay)	Plant Breeding Assistant, I.P.I., Indore.	
42.	Assistant Farm Superintendent	Mr. S. C. Talesara, B.Ag. (Bombay)	Research Student, Indian Central Cotton Committee.	
43.	Personal Assistant	Mr. A. N. Srivastava, M.Sc. (Lucknow)	——	

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1939—*contd.*

INSTITUTE OF PLANT INDUSTRY, INDORE—*contd.*

44.	Statistician	Dr. C. Chandra Sekar, M.Sc. (Nagpur), Ph.D. (London).	——
45.	Genetical Assistant	Mr. Bholanath, M. Sc. (Punjab)	Research Student, Indian Central Cotton Committee.
46.	Plant Breeding Assistant	Mr. C. P. Dutt, M.Sc. (Calif.)	——
47.	Seed Extension Officer	Mr. K. M. Simlote, B.Ag. (Nagpur)	——
48.	Senior Botanical Assistant	Mr. P. D. Gadkari, M.Sc. (Nagpur)	King Edward Memorial Inland Research Scholar at I.P.I.
49.	Second Plant Breeding Assistant	Mr. M. A. A. Ansari, M.Sc. (Lucknow)	Research Student, Institute of Plant Industry, Indore.
50.	Second Botanical Assistant	Mr. D. Ganesan, B.A., M.Sc. (Madras).	Research Student, Institute of Plant Industry, Indore.
51.	Agronomical Assistant	Mr. V. N. Bhargava, B.Sc. (Allahabad)	Do. do.
52.	Analytical Assistant	Mr. L. N. Desai, B.Sc. (Agra)	——
53.	Analytical Assistant	Mr. C. Parthasarathy, B.Sc. (Agri.) (Madras)	——
54.	Physical Chemistry Assistant	Mr. P. M. Salvekar, B.Sc. (Bombay)	——
55.	Biochemical Assistant	Mr. Y. Subha Rao, B.Sc. (Mysore), B.Ag. (Bombay).	——
56.	Statistical Assistant	Mr. G. K. Sant, B.Sc. (Agra)	——
57.	Artist	Mr. J. S. Onkar	——

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1939—*contd.*

		BOMBAY RESEARCH SCHEMES.	
		(i) Broach Cotton Breeding Scheme.	
58.	Cotton Breeder	Mr. P. L. Patel, M.Sc. (Agri.), Iowa, (U.S.A.) ..	——
59.	Botanical Assistant	Mr. S. J. Patel, M.Ag. (Bombay)	On deputation from Bombay Department of Agriculture.
60.	Botanical Assistant	Mr. D. D. Gopani, B.Sc. (Agri.)	——
		(ii) Jalgaon Cotton Breeding Scheme.	
61.	Botanical Assistant	Mr. D. B. Barve, B.Ag.	On deputation from Bombay Department of Agriculture.
62.	Botanical Assistant	Mr. S. N. Deshpande, B.Sc. (Agri.), Bombay ..	——
		(iii) Scheme for Interspecific Hybridization.	
63.	Agricultural Overseer	Mr. K. C. Amin	On deputation from Bombay Department of Agriculture.
		(iv) Poona Cotton Wilt Breeding Scheme.	
64.	Pathological Assistant	Mr. J. D. Ranadive, B. Ag. (Bombay)	Research Student, Indian Central Cotton Committee.
65.	Pathological Assistant	Mr. Y. S. Kulkarni, B.Ag. (Bombay)	——
		(v) Cotton Wilt Breeding Scheme for Surat Area.	
66.	Agricultural Overseer	Mr. S. P. Shah, B.Ag. (Bombay)	——
		(vi) Dhelleras—Wagad Cotton Breeding Scheme, Viramgam.	
67.	Agricultural Overseer	Mr. R. J. Naik, M.Ag. (Bombay)	On deputation from Bombay Department of Agriculture.
		(vii) Scheme for Experiments on cotton at Bijapur Dry Farming Scheme.	
68.	Agricultural Overseer	Mr. B. M. Henagodinath, B.Sc. (Agri.) ..	——

BOMBAY SEED DISTRIBUTION SCHEMES.

(i) Surat Scheme.

69.	Cotton Assistant	Mr. V. V. Patel, B.Ag. (Bombay)	On deputation from Bombay Department of Agriculture.	

(ii) Khandesh (Jarila) Scheme.

70.	Superintendent, Bhadgaon Farm	Mr. S. S. Surve, B.Ag.	Do.	do.
71.	Cotton Supervisor, Jalgaon	Mr. R. B. Nimbalkar, B.Ag. (Bombay)	Do.	do.
72.	Agricultural Overseer, Jalgaon	Mr. V. M. Vartak, B.Sc. (Agri.), (Hons.)	——	

(iii) B.D. 8 Scheme.

73.	Cotton Supervisor, Broach	Mr. L. N. Patel, B.Ag. (Bombay)	Permanent Government servant.	
74.	Agricultural Overseer	Mr. D. A. Dave, B.Ag. (Bombay)	——	

(iv) Jayawant and Gadag No. 1 Scheme.

75.	Agricultural Overseer	Mr. B. S. Patil, B.Ag. (Bombay)	——	
76.	Agricultural Overseer	Mr. B. M. Dhumma, B.Ag. (Bombay)	——	
77.	Agricultural Overseer	Mr. B. S. Tadsur, B.Ag. (Bombay)	——	
78.	Agricultural Overseer	Mr. D. A. Hiremath, B.Ag. (Bombay)	——	
79.	Agricultural Overseer	Mr. S. M. Tippashetti, B.Ag. (Bombay)	——	
80.	Agricultural Overseer	Mr. S. F. Chandrannaver, B.Ag. (Bombay)	Worked as District Supervisor in the Economic Enquiry Scheme.	
81.	Agricultural Overseer	Mr. S. T. Arlelimath, B.Ag.	——	

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1939—*contd.*

		BOMBAY COTTON FORECAST IMPROVEMENT SCHEME.	
82.	Provincial Officer	Mr. G. R. Ambekar, School Final	On deputation from Bombay Department of Agriculture.
		SIND JASSID INVESTIGATION SCHEME.	
83.	Research Assistant	Mr. M. S. Patel, B.Ag. (Bombay)	Formerly Research Assistant, Surat Bollworm Scheme and C. P. Entomological Scheme.
84.	Non-Graduate Assistant	Mr. Meghraj	——
		SIND SEED DISTRIBUTION SCHEME.	
85.	Senior Cotton Superintendent	Mr. H. A. Idnani, B.Ag. (Bombay)	Research Student, Indian Central Cotton Committee, on deputation from Sind Department of Agriculture.
86.	Second Cotton Superintendent	Mr. W. P. Shahani, B.Ag. (Bombay)	On deputation from Sind Department of Agriculture.
87.	Senior Assistant	Mr. A. R. Arain, B.Ag. (Bombay), C.H.D. (Manchester).	——
88.	Junior Assistant	Mr. Lekhraj Parmanand	On deputation from Sind Department of Agriculture.
89.	Junior Assistant	Mr. W. R. Shahani, F.Y.A.	——
90.	Junior Assistant	Mr. M. A. Bhatti, B.Ag. (Bombay)	On deputation from Sind Department of Agriculture.
91.	Junior Assistant	Mr. S. R. Chandani, B.Ag. (Bombay)	Do. do.
92.	Junior Assistant	Mr. S. M. Pherwani, B.Ag. (Bombay)	Do. do.

SIND SEED DISTRIBUTION SCHEME—*contd.*

93.	Junior Assistant	Mr. G. S. Kani, B.Ag. (Bombay)	——	
94.	Junior Assistant	Mr. R. M. Ranji, Dip. Ag. (Bombay)	Ten years under Sind Physiological Scheme.	
95.	Junior Assistant	Mr. Naraindas, T. T.	——	
96.	Junior Assistant	Mr. S. M. Khalsa, B.Ag. (Bombay)	——	
97.	Junior Assistant	Mr. Premsingh T., F. Y. A.	——	
98.	Junior Assistant	Mr. Lachmandas, M. S.	——	

SIND BLACK-HEADED CRICKET SCHEME.

99.	Assistant Entomologist I/C.	Mr. Gobind Ram, M.Sc. (Hons.) (Punjab)	Research Student, Imperial Agricultural Research Institute, New Delhi.	

CENTRAL PROVINCES AND BERAR RESEARCH SCHEMES.

Cotton Breeding Scheme.

100.	Economic Botanist for Cotton	Mr. S. S. Pande, M.Sc. (Punjab)	Research Student, Indian Central Cotton Committee.	
101.	Research Officer	Mr. S. C. Roy, L.Ag., and Post-Graduate, Pusa.	On deputation from Central Provinces Department of Agriculture.	
102.	Research Officer	Mr. D. G. Sawargaonkar, L.Ag. (Hons.)	On deputation from Central Provinces Department of Agriculture.	
103.	Junior Research Assistant	Mr. D. Y. Bhand, L.Ag. (Hons.)	Do.	do.
104.	Junior Research Assistant	S. L. Nema, B.Ag.	Do.	do.
105.	Junior Research Assistant	Mr. N. P. Deshmukh, B.Ag.	Do.	do.

COMBINED LONG-STAPLE COTTON AND MARKETING OF VERUM COTTON SCHEMES IN C. P. AND BERAR.

106.	Agricultural Assistant	Mr. L. P. Khare, B.Ag.		—
107.	Agricultural Assistant	Mr. K. S. S. Chowhan, B.Ag.		—
108.	Agricultural Assistant	Mr. G. N. Wardadkar, B.Ag.		—
109.	Agricultural Assistant	Mr. L. B. Deshpande, B.Ag.		—
110.	Agricultural Assistant	Mr. G. C. Tiwari, Certificate Course of Agricultural College, Nagpur		—
111.	Agricultural Assistant	Mr. M. D. Anadeo, B.Ag.		—
112.	Agricultural Assistant	Mr. V. S. Hingankar, B.Ag.		—
113.	Agricultural Assistant	Mr. T. N. Puranik, B.Ag.		—
114.	Agricultural Assistant	Mr. Gajraj Singh, B.Ag.		—
115.	Agricultural Assistant	Mr. G. S. Bhagwat, B.Ag.		—

MADRAS RESEARCH SCHEMES.

(*i*) *Pempheres and Physiological Scheme.*

116.	Bio-Chemist	Dr. S. Kasinatha Ayyar, B.A., Ph.D. (London)	On deputation from Madras Department of Agriculture.
117.	Assistant Botanist	Mr. K. Dharmarajulu, M.Sc. (Bombay)	Research Student, Indian Central Cotton Committee.
118.	Assistant Botanist	Mr. G. Sheshadri Ayyangar, M.A.	—
119.	Assistant Botanist	Mr. V. Ramaswami Mudaliar, B.A.	—
120.	Assistant Entomologist	Mr. V. Margabandu, M.A.	On deputation from Madras Department of Agriculture.
121.	Assistant Chemist	Mr. K. Saptharishi, B.Sc. (Ag.)	Do. do.

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1939—*contd.*

MADRAS RESEARCH SCHEMES—*contd.*

(*ii*) *Breeding of Nadam Cotton.*

122.	Assistant	Mr. P. N. Krishnaswami Rao, B.Sc., Ag.	On deputation from Madras Department of Agriculture.	

(*iii*) *Mungari Breeding Scheme.*

123.	Assistant	Mr. V. K. Subramanaya Mudaliar, L.Ag.	On deputation from Madras Department of Agriculture.	

(*iv*) *Seed Farm Work, Tirupur Co-op. Cotton Sale Society.*

124.	Agricultural Demonstrator	Mr. P. P. Syed Mohammed	Do.	do.

PUNJAB RESEARCH SCHEMES.

(*i*) *Botanical Scheme.*

125.	Cotton Research Botanist	Mr. Mohammad Afzal, B.Sc. (Agri.) (Punjab), A.I.C.T.A. (Trinidad).	Research Student, Indian Central Cotton Committee, and State Research Scholar. On deputation from Punjab Department of Agriculture.
126.	Assistant to Cotton Research Botanist	Chaudhri Mohammad Akbar, L.Ag.	On deputation from Punjab Department of Agriculture.
127.	Extra Assistant Director of Agriculture (Cotton).	Mr. S. Sarup Singh, L.Ag., M.Sc. (Texas), U.S.A.	Do. do.
128.	Agricultural Assistant	S. Fateh Ali Shah, B.Sc. (Agri.)	Do. do.
129.	Agricultural Assistant	S. Kehr Singh, B.Sc. (Agri.)	Do. do.
130.	Agricultural Assistant	Bh. Autar Singh, B.Sc. (Agri.)	Do. do.
131.	Agricultural Assistant	Bh. Santokh Singh, B.Sc. (Agri.)	Do. do.

		PUNJAB RESEARCH SCHEMES—*contd.*		
		(*i*) *Botanical Scheme*—contd.		
132.	Agricultural Assistant	Ch. Kanshi Ram, B.Sc. (Agri.)	On deputation from Punjab Department of Agriculture.	
133.	Agricultural Assistant (A Class)	Ch. Mohammad Rashid Khan, L.C. (Course), Munshi Fazil (F.A., Punjab University).	Do.	do.
134.	Agricultural Assistant (B Class)	Mr. S. E. Daniel, L.C. (Course)	Do.	do.
135.	Agricultural Assistant (A Class)	Mr. Satya Prakash Kohli, B.Sc. (Agri.)	——	
136.	Agricultural Assistant (B Class)	Mr. Sikandarlal Seghal, B.Sc. (Agri.)	On deputation from Punjab Agricultural Department.	
137.	Statistical Assistant	L. Dwarka Nath Nanda, M.A., B.Sc. (Agra).	——	
		(*ii*) *Scheme for Clean-up Campaign of Spotted Bollworm.*		
138.	Agricultural Assistant	Pt. Ganda Ram, B.Sc., F.E.L.	——	
139.	Agricultural Assistant	L. Ladha Ram, B.Sc.	——	
		(*iii*) *Root Rot Scheme.*		
140.	Assistant Cotton Mycologist	Dr. R. S. Vasudeva, B.Sc., Ph.D. (London), D.I.C. (London).	——	
141.	Agricultural Assistant	Ch. Mohd. Ashraf, B.Sc. (Agri.)	——	
		(*iv*) *Physiological* (*Periodical Partial Failure*) *Scheme.*		
142.	Plant Physiologist	Prof. R. H. Dastur, M.Sc., F.L.S.	On deputation from Bombay Educational Department.	
143.	Assistant Physiologist	Dr. S. S. Verma, D.Sc. (Madras), Ph.D. (London), D.I.C.	Research Student, Indian Central Cotton Committee.	

PUNJAB RESEARCH SCHEMES—*contd.*

(iv) Physiological (Periodical Partial Failure) Scheme—contd.

144.	Bio-Chemist	Dr. K. M. Samant, M.Sc., Ph.D.		——
145.	Soil Assistant	Dr. R. D. Asana, M.Sc. (Bom.), Ph.D. (London).		——
146.	Research Assistant	Dr. J. J. Chinoy, M.Sc. (Bombay), Ph.D. (London), D.I.C.		——
147.	Agricultural Assistant	Mr. Abdul Ahad, B.Sc. (Agri.)		——
148.	Agricultural Assistant	Mr. S. Sucha Singh, B.Sc. (Agri.)		——
149.	Agricultural Assistant	Mr. S. Mukhtar Singh, B.Sc. (Agri.)		——

(v) Cotton Jassid Investigation Scheme.

150.	Agricultural Assistant	Mr. Manzoor Abbas, B.Sc. (Agri.)		On deputation from Punjab Agricultural Department.

UNITED PROVINCES RESEARCH SCHEMES.

Botanical Scheme.

151.	Senior Botanical Assistant	Dr. D. N. Srivastav, B.Sc. (Agri.), Ph.D. (Lond.)		——
152.	Senior Botanical Assistant	Mr. B. M. Dabral, M.Sc.		Late Cotton Physiologist, Agricultural Research Station, Sakrand, Sind.

BENGAL.

Comilla Cotton Scheme.

153.	Cotton Research Officer	V. N. Paranjpe, B.Sc. (Allahabad)		——

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1939—*contd.*

HYDERABAD RESEARCH SCHEMES.

(*i*) *Botanical Scheme.*

154.	Cotton Research Botanist	Rai Saheb Kalidas Sawhney, M.Sc. (Punjab) ..	Late Cotton Breeder, in the Department of Agriculture, Iraq, Baghdad.
155.	Assistant Cotton Research Botanist ..	Mr. D. V. Narayanayya, Dip. Agri. (Poona) ..	On deputation from Bombay Department of Agriculture.
156.	Assistant Cotton Research Botanist ..	Mr. V. K. Bederker, B.A. (Madras), B.Ag. (Bombay).	On deputation from H. E. H. the Nizam's Department of Agriculture.
157.	Inspector, Variety Testing Stations ..	Mr. A. R. Betigeri, B.Ag. (Bombay)	——

(*ii*) *Hyderabad (Pink and Spotted Bollworm) Scheme.*

158.	Cotton Entomologist	Mr. H. D. Nangpal, M.Sc. (Hons.), (Punjab)	Research Student, Indian Central Cotton Committee and Assistant Entomologist, United Provinces Pink Bollworm Scheme.
159.	Senior Research Assistant	Mr. N. T. Nadkarny, B.Ag. (Bombay); Post-Graduate Course in Entomology at Poona Agricultural College.	——
160.	Junior Research Assistant	Mr. T. E. Krishnaswamy, B.Sc. (Agri.), (Coimbatore).	——
161.	Junior Research Assistant	Mr. Mohd. Ahsan, B.Sc., Osmania University ..	——
162.	Junior Research Assistant	Mr. V. K. Dhabholkar, B.Sc. (Agri.)	——

(*iii*) *Kumpta Cotton Improvement Scheme.*

163.	Senior Research Assistant	Mr. N. R. Yardi, B.Ag. (Bombay)	——

HYDERABAD SEED DISTRIBUTION SCHEME.

164.	Inspector	Mr. M. V. Chitnis	——

BARODA RESEARCH SCHEMES.

(i) Root Rot Scheme.

165.	Breeding Assistant	Mr. K. N. Ambegaokar, B.Sc. (Bom.), M.Sc. (Benares).	——
166.	Mycological Assistant	Mr. G. H. Desai, B.Ag. (Bombay)	——

(ii) Plant Puller Propaganda Scheme.

167.	Plant Puller Officer, Baroda District ..	Mr. D. G. Patel, B.Ag.	——
168.	Non-graduate Assistant, Navsari	Mr. R. S. Patel	——

(iii) B.D. 8 Cotton Seed Distribution Scheme.

169.	Cotton Officer, Propaganda Work	Mr. K. C. Patwa, B.Ag., F.R.H.S.	——

(iv) Dholleras Cotton Improvement Scheme.

170.	Cotton Breeder	Mr. A. F. Patel, B.Ag. (Bombay)	——
171.	Assistant Cotton Breeder	Mr. R. M. Patel, B.Sc. (Bombay)	——

BIKANER BENGALS COTTON IMPROVEMENT SCHEME.

172.	Cotton Assistant	Mr. Arjan Singh, B.Sc.	——

MYSORE (DODDAHATHI) SCHEME.

173.	In charge Breeding work and Laboratory Investigations.	Mr. G. Srinivasa Iyengar, M.Sc.	——
174.	Field and Breeding Assistant	Mr. S. G. Narasimhacher, M.Sc.	——

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31st, 1939—*concld.*

TECHNOLOGICAL ASSISTANTS PAID BY INDIAN CENTRAL COTTON COMMITTEE.

175.	Under Cotton Specialist, Coimbatore ..	Mr. R. L. N. Iyengar, M.Sc.	Research Student, Indian Central Cotton Committee.	
176.	Under Deputy Director of Agriculture, S.D., Dharwar.	Mr. H. R. Nayak, Inter Science (Madras) ..	Formerly Junior Tester at Technological Laboratory, Bombay.	
177.	Under Deputy Director of Agriculture, Gujerat, Surat.	Mr. M. U. Patmar, M.Sc. (Bombay)	Research Student, Indian Central Cotton Committee.	
178.	Under Cotton Research Botanist, Lyallpur.	Mr. S. Raja Raman, B.A. (Madras), M.Sc. (Benares), A. Inst. P. (London).	—"—	
179.	Under Botanist, Agricultural Research Station, Sakrand.	Mr. K. S. Marar, B.A. (Madras), LL.B. (Bom.)..	Formerly Junior Tester at Technological Laboratory, Bombay.	
180.	Under Cotton Research Botanist, Hyderabad—Deccan.	Mr. K. G. Deo, Inter Arts	Do.	do.

APPENDIX XVII.

LIST OF RESEARCH STUDENTS.

Serial No.	Year of appointment.	Name.	Branch of Cotton Research in which scholarship granted.	Where posted for training.	How employed on termination of scholarship.	How now employed.	Remarks.
1	1923	Sohan Singh Bindra, M.Sc. Honours School (Punjab).	Cotton Entomology.	Lyallpur	Entomological Asst., Pink Bollworm Scheme, Punjab. In 1931 joined the Agri. Dept., Kenya.	....	
2	,,	Mohammad Afzal, B.Sc. (Punjab).	Cotton Botany (Plant Breeding.)	Do.	Punjab Govt. Scholar at the Imperial College of Tropical Agriculture, Trinidad.	Punjab Agricultural Dept., Cotton Research Botanist. Botanical Research Scheme.	
3	,,	Sheo Shanker Pande, M.Sc. (Punjab).	Do. ..	Nagpur	Senior Research Asst., Central Provinces Botanical Research Scheme.	Temporary Economic Botanist for Cotton, Central Provinces & Berar.	
4	,,	Jiwan Singh, M.Sc. (Punjab).	Cotton Mycology ..	Do.	SeniorMycologicalAsst. C. P. Mycological, Scheme.	Reader in Botany, Khalsa College, Amritsar.	
5	,,	Ilabanto Banerji, M.Sc. (Calcutta).	Cotton Botany ..	Coimbatore.. ..	Senior Research Student, Inst. of Plant Industry and later under Dr. M. A. Sampath Kumaran, M.A., Ph.D., Bangalore.	University Lecturer in Botany, Calcutta University.	

LIST OF RESEARCH STUDENTS—*contd.*

Serial No.	Year of appointment.	Name.	Branch of Cotton Research in which scholarship granted.	Where posted for training.	How employed on termination of scholarship.	How now employed.	Remarks.
6	1923	B. B. Desai, B.Ag. (Bombay).	Cotton Botany ..	Dharwar	Senior Research Student at the Inst. of Plant Industry, Indore.	Sind Agricultural Dept.	
7	1924	Atul Chandra Dutta, M.Sc. (Calcutta).	Do.	Coimbatore.. ..	....	Lecturer in Botany, Cotton College, Gauhati, Assam.	
8	,,	N. Hari Rao, M.Sc. (Calcutta)	Textile Physics ..	Technological Research Laboratory, Matunga, Bombay.	Junior Research Asst. (Physicist), Technological Research Laboratory, Matunga, Bombay.	Senior Research Assistant (Physicist), Technological Research Laboratory, Matunga, Bombay.	I. C. C. C.
9	,,	H. D. Nangpal, M.Sc. Honours School (Punjab).	Cotton Entomology	Cawnpore	Research Assistant, Pink Bollworm Scheme, United Provinces.	Entomologist, Hyderabad Pink and Spotted Bollworm Scheme, Parbhani.	I. C. C. C.
10	,,	Sant Bahadur Singh, M.Sc. (Benares Hindu University).	Cotton Physiology	Surat	Resigned to go to Cambridge for further study.	....	
11	1925	Viswa Ram Singh, M.Sc., (Benares Hindu University)	Cotton Entomology	Cawnpore	Entomological Asst., United Provinces Pink Bollworm Scheme.	United Provinces Subordinate Agricultural Service.	
12	,,	Akbar Ali, B.Sc. (Punjab) ..	Cotton Botany (Plant Breeding).	Lyallpur	Technical Asst. to the Cotton Research Botanist, Punjab.	Assistant Marketing Officer, Punjab Cotton Marketing Survey Scheme.	I. C. C. C.

LIST OF RESEARCH STUDENTS—*contd.*

Serial No.	Year of appointment.	Name.	Branch of Cotton Research in which scholarship granted.	Where posted for training.	How employed on termination of scholarship.	How now employed.	Remarks.
13	1925	Kidar Nath Trehan, M.Sc. (Punjab).	Cotton Entomology	Lyallpur	Entomological Asst., Punjab Agri. Dept.	Punjab Agricultural Dept.	Held Senior Research Studentship for study of "white fly" problem at Khanewal—Awarded Training Grant for Study abroad. Obtained Ph.D. of London University.
14	,,	S. E. Kumana, B.A., M.Sc. (Bombay).	Cotton Technology	Technological Research Laboratory, Matunga, Bombay.	Technological Asst., Dharwar, upto 31st July 1929. Went abroad for further study.	....	
15	,,	J. D. Ranadive, B.Ag. (Bombay).	Cotton Mycology ..	Dharwar	Assistant to the Special Cotton Mycologist, Dharwar.	Pathological Assistant, Cotton Wilt Breeding Scheme, Poona.	I. C. C. C.
16	,,	P. K. Roy, M.Sc. (Dacca) ..	Textile Physics ..	Technological Research Laboratory, Matunga, Bombay.	Resigned in July 1925	....	
17	,,	K. R. Sen, M.Sc. (Dacca) ..	Textile Physics ..	Technological Research Laboratory, Matunga, Bombay.	Technological Asst., Coimbatore.	Senior Research Physicist, Indian Central Jute, Cttee.	Obtained Doctorate (D.Sc.) in 1934.
18	,,	L. N. Rao, M.Sc. (Calcutta) ..	Cotton Microscopy	Do.	....	Lecturer in Botany, Central College, Bangalore.	Resigned in August 1926.
19	1926	D. F. Kapadia, B.A., (Bombay), M.Sc. (Tech.) (Manchester).	Cotton Technology	Do.	Assistant Technologist, Technological Research Laboratory, Matunga, Bombay.	Head of the Textile Manufacturers Dept., Victoria Jubilee Technical Institute, Bombay.	

LIST OF RESEARCH STUDENTS—*contd.*

Serial No.	Year of appointment.	Name.	Branch of Cotton Research in which scholarship granted.	Where posted for training.	How employed on termination of scholarship.	How now employed.	Remarks.
20	1926	Ram Saran Koshal, M.Sc. (Punjab).	Textile Physics ..	Technological Research Laboratory, Matunga, Bombay	Junior Research Asst., (Physicist), Technological Research Laboratory, Matunga, Bombay.	Senior Research Assistant (Physicist), Technological Research Laboratory, Matunga, Bombay.	I. C. C. C.
21	,,	M. A. Shama Iyengar, B.Ag. (Bombay).	Cotton Physiology..	Surat	Assistant, Surat Physiological Scheme.	Sind Agricultural Dept., Senior Assistant to Agricultural Chemist and Soil Physicist, Sakrand.	Awarded a Training Grant for Foreign Study in 1933.
22	,,	Karam Singh Lamba, B.Sc., Honours School (Punjab).	Cotton Entomology	Lyallpur	....	....	Resigned in July 1927.
23	,,	Y. D. Wad, M.A., M.Sc. (Bombay), A. I. I. Sc.	Cotton Bio-chemistry.	Coimbatore.. ..	Chemical Assistant, Institute of Plant Industry, Indore.	Chemist and Agronomist, Institute of Plant Industry, Indore.	I. C. C. C.
24	,,	H. A. Idnani, B.Ag. (Bombay.)	Cotton Botany ..	Institute of Plant Industry, Indore.	Asst. at the Sakrand Exptal. Stn., Sind.	Sind Agricultural Dept., Senior Cotton Supt., Sind Seed Distribution Scheme, Dadu.	I. C. C. C.
25	,,	S. C. Talesara, B.Ag. (Bombay).	Cotton Botany ..	Do. ..	Junior Assistant, Institute of Plant Industry, Indore.	Asst. Farm Supdt., Institute of Plant Industry, Indore.	I. C. C. C.

Serial No.	Year of appointment.	Name.	Branch of Cotton Research in which scholarship granted.	Where posted for training.	How employed on termination of scholarship.	How now employed.	Remarks.
26	1927	R. Lakshminarayana Iyengar, M.Sc.	Cotton Technology.	Technological Research Laboratory, Matunga, Bombay.	Technological Assistant, Coimbatore.	Technological Assistant, Coimbatore.	I. C. C. C.
27	,,	Anant Krishna Thakur, M.Sc. (Bombay).	Cotton Biochemistry	Institute of Plant Industry, Indore.	Asst. Chemist, Indian Lac Research Association.	Asst. Chemist, Indian Lac Research Association.	
28	,,	Dev Raj Mehta, B.Sc., Hons. School (Punjab).	Cotton Entomology	Lyallpur	Punjab Govt. Scholar for study abroad.	....	Obtained Ph.D. (Cantab.)
29	,,	Uma Shanker, M.Sc. (Allahabad).	Cotton Entomology	Cawnpore	Govt. Scholar for study abroad.	Asst. Professor of Entomology, Agri. College, Cawnpore.	Obtained Doctorate at Edinburgh.
30	,,	Shripad Shamrao Rane, M.Sc. (Benares Hindu University).	Cotton Physiology	Institute of Plant Industry, Indore.	....	....	
31	,,	Sant Singh Verma, M.Sc. (Benares Hindu University).	Cotton Physiology in connection with Cotton Wilt Investigation.	Dharwar	Temporary Microscopist, Punjab Botanical Scheme, Lyallpur.	Assistant Physiologist, Punjab Physiological (Cotton Failure Research) Scheme.	I. C. C. C.
32	,,	Lakshmi Narayan Mathur, M.Sc. (Punjab).	Cotton Breeding ..	Institute of Plant Industry, Indore.	Crop Botanist, Ujjain, Gwalior Dept. of Agriculture.	Crop Botanist, Ujjain, Gwalior Dept. of Agriculture.	
33	,,	Kadaba Rangasamy, M.Sc. (Calcutta).	Cotton Breeding ..	Coimbatore.. ..	....	....	
34	,,	S. Shamser Singh, M.Sc. (Punjab).	Cotton Agronomy	Institute of Plant Industry, Indore.	Agricultural Officer, Bikaner State.	Agricultural Officer, Bikaner State.	

Serial No.	Year of appointment.	Name.	Branch of Cotton Research in which scholarship granted.	Where posted for training.	How employed on termination of scholarship.	How now employed.	Remarks.
35	1928	K. Dharmarajulu, M.Sc. (Bombay).	Cotton Mycology ..	Dharwar	Junior Assistant, Dharwar Cotton Wilt Scheme.	Asst. Botanist, Madras Pempheres and Physiological Scheme.	I. C. C. C.
36	,,	Piare Mohan, B.Sc., Honours School (Punjab), M.Sc.	Cotton Entomology	Cawnpore	Field Asst., Punjab White-Fly Investigation.	Assistant Entomologist under the Plant Pathologist, Poona.	
37	,,	R. N. Gidwani, B.Ag. (Bombay).	Cotton Agronomy ..	Surat	Senior Assistant to Cotton Supervisor, Indus Left Bank, Sind Cotton Seed Extension Scheme.	Sind Agri. Depart., Inspector of Agri., Eastern Nara Circle, Mirpurkhas.	
38	,,	M. Kanti Raj, M.A., B.Sc. (Agri.) (University of Edinburgh).	Do. ..	Institute of Plant Industry, Indore.	Madras Agri. Service..	Madras Agricultural Service, Supdt., Agricultural Research Station, Anakapalle.	
39	,,	C. Nanjundayya, M.Sc. (Calcutta).	Cotton Technology.	Technological Research Laboratory, Matunga, Bombay.	Temporary Research Asst., Technological Research Laboratory, Matunga, Bombay.	Junior Research Assistant (Physicist), Technological Research Laboratory, Matunga, Bombay.	I. C. C. C.
40	1929	Srinagabushana, B.Sc. ..	Do. ..	Do. ..	Do. ..	Junior Research Assistant, Technological Research Laboratory. Matunga, Bombay.	I. C. C. C.
41	,,	Bhai Pratap Singh Bhullar, B.Sc. (Agri.) (Punjab).	Cotton Marketing and Economics.	Lyallpur	Punjab Agriculture Dept.	Punjab Agriculture Dept.	

LIST OF RESEARCH STUDENTS—*contd.*

Serial No.	Year of appointment.	Name.	Branch of Cotton Research in which scholarship granted.	Where posted for training.	How employed on termination of scholarship.	How now employed.	Remarks.
42	1929	Bhai Ajaib Singh Gulzar, B.Sc. (Agri.) (Punjab).	Cotton Marketing and Economics.	Lyallpur	Punjab Agriculture Dept.	Punjab Agriculture Dept.	
43	1930	Madan Lal Bhatia, M.Sc. (Punjab).	Cotton Entomology	Do. ..	Went abroad for further study.	....	
44	,,	Bhola Nath, M.Sc. (Punjab).	Cytology and Plant Breeding.	Institute of Plant Industry, Indore.	Genetical Assistant, Inst. of Plant Industry, Indore.	Genetical Assistant, Institute of Plant Industry, Indore.	I. C. C. C.
45	,,	Pran Nath Mehra, M.Sc. (Punjab).	Do. ..	Sakrand	Resigned		
46	,,	Brajendra Nath Bhargava, M.A. (Lucknow).	Cotton Marketing & Economics.	Lucknow	....	....	
47	1931	B. S. Sheshgiri, B.Ag. (Bombay.)	Do. ..	Surat	Resigned		
48	,,	K. R. Dube, B.Ag. (Nagpur).	Do. ..	Nagpur	District Supervisor, Enquiry into the cost of production of cotton and sugarcane crops, Central Provinces.	....	
49	,,	Santokh Singh Jaggi, B.Sc. (Agri.) (Punjab).	Do. ..	Lyallpur	Agricultural Assistant, Scheme for Survey of Disease of Malformation in Punjab American Cotton.	Agricultural Asst., Punjab Botanical Research Scheme.	I. C. C. C.

LIST OF RESEARCH STUDENTS—*contd.*

Serial No.	Year of appointment.	Name.	Branch of Cotton Research in which scholarship granted.	Where posted for training.	How employed on termination of scholarship.	How now employed.	Remarks.
50	1931	Doraiswami Ayyar, B.A., B.Sc. (Agri.) (Madras).	Cotton Marketing and Economics.	Madras	Madras Agricultural Service.	Madras Agricultural Service.	
51	1935	Krishna Behari Lal, M.Sc. (Cal.), Ph.D. (Edinburgh).	Cotton Entomology	Lyallpur		Second Assistant Entomologist at the Imperial Agricultural Research Institute, New Delhi.	
52	1936	M. U. Parmar, M.Sc., (Bombay).	Cotton Technology	Technological Research Laboratory, Matunga, Bombay.	Technological Assistant, Surat.	Technological Assistant, Surat.	I. C. C. C.
53	,,	G. Rama Rau, B.Sc. (Bombay).	Do. ..	Do.	....	....	
				Foreign Research Studentships.			
	1931	Sant Singh Verma, M.Sc. (Benares Hindu University)	Plant Physiology ..	Imperial College of Science and Technology, London.	Asst. Physiologist, Punjab Physiological (Cotton Failure Research) Scheme.	Asst. Physiologist, Punjab Physiological (Cotton Failure Research) Scheme.	Obtained Ph.D. of the London University.
				Training Grants.			
1	1933	S. N. Venkataramanan, B.A., B.Sc. (Agri.) (Madras).	Cotton Statistics ..	Calcutta	Madras Agricultural Service.	Madras Agricultural Service, Asst. Marketing Officer.	
2	,,	C. Jagannatha Rao, B.A. (Madras).	Cotton Physiology..	Madras	Madras Agricultural Service.	Madras Agricultural Service.	

LIST OF RESEARCH STUDENTS—*contd.*

Serial No.	Year of appointment.	Name.	Branch of Cotton Research in which scholarship granted.	Where posted for training.	How employed on termination of scholarship.	How now employed.	Remarks.
3	1936	P. Abraham, B.A. (Madras)..	Cotton Cytology ..	Coimbatore.. ..	Asst. to the Cotton Specialist, Coimbatore.	Asst. to the Cotton Specialist, Coimbatore.	
				Foreign Training Grants.			
1	1933	M. Taskhir Ahmad, B.Sc. (Agri.) (Punjab).	Cotton Entomology	Trinity College, Cambridge.	Resigned	Assistant to Entomologist, Imperial Agri. Research Inst., New Delhi.	Obtained Ph.D. of the London University.
2	1933	G. B. Patel, B.Ag. (Bombay).	Cotton Breeding ..	University of California, U. S. A.	....	Bombay Agricultural Service.	Obtained M.Sc. of California University.
3	1934	M. A. Shama Iyengar, B.Ag. (Bombay.)	Study of kalar (alkali) lands and cultivation of superior Egyptian cottons with special reference to soil and environmental conditions.	Tour in Hungary, England and Egypt.	Sind Agricultural Dept., Senior Asst. to Agricultural Chemist and Soil Physicist.	Sind Agricultural Dept., Senior Asst. to Agricultural Chemist and Soil Physicist.	
4	,,	Nazir Ahmad, M.Sc. (Punjab).	Cotton Entomology	Imperial College of Science and Technology, London.	....	....	Obtained Ph.D. of the London University.
5	1936	Kidar Nath Trehan, M.Sc. (Punjab).	Applied Entomology	Rothamsted Expt. Stn.	Punjab Agri. Dept. ..	Subordinate Agricultural Service, Punjab Agri. Dept.	Obtained Ph.D. of the London University.
6	1938	V. G. Panse, B.Sc.	Statistics ..	Rothamsted Expt. Station and London University.	Under training.		

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ANNUAL REPORT

OF THE

INDIAN CENTRAL COTTON COMMITTEE

FOR THE

YEAR ENDING 31st AUGUST, 1940.

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ANNUAL REPORT OF THE INDIAN CENTRAL COTTON COMMITTEE FOR THE YEAR ENDING 31st AUGUST, 1940.

CHAPTER I.

1. CONSTITUTION, AIMS AND OBJECTS.

THE Indian Central Cotton Committee was constituted by the Government of India in the Department of Revenue and Agriculture, in their Resolution No. 404-22, dated the 31st March, 1921, as a result of the recommendation of the Indian Cotton Committee of 1917-18. Originally, the Committee was purely an advisory body but, with its incorporation under the Indian Cotton Cess Act in 1923, it became an administrative body having at its disposal funds "for the improvement and development of the growing, marketing and manufacture of cotton in India." The funds of the Committee are derived from the cotton cess of two annas per bale (four annas for the first three years) which was imposed in 1923. Having complete control over its funds, the Committee has been able to build up a satisfactory reserve and is at present spending about Rs. 10,00,000 per annum on cotton improvement, mainly on agricultural and technological research and seed distribution schemes.

Including, as it does, representatives of growers, agricultural officers, traders, spinners and manufacturers, the Committee has been an invaluable forum for the discussion of many problems of general concern. The ever-increasing understanding which has arisen from the association of leading commercial representatives with growers and research workers has led to developments which, at one time, seemed impossible. Whilst the Committee's constitution ensures a broad outlook on the many problems affecting the cotton industry, its primary concern is the interest and welfare of the cotton grower. In this connection, it should be mentioned that the readiness with which trade associations, particularly the East India Cotton Association, have taken action on recommendations designed to benefit the cotton grower has made the task of the Committee much easier.

The activities of the Committee now extend to all branches of cotton improvement in India, whilst as an authoritative body to advise the Central and Provincial Governments on the important matters of cotton policy, it has attained an outstanding position. Funds are provided for research into cotton problems of all-India importance and for the development, extension and marketing of improved varieties of cotton. The aim always is to supplement and not supplant the work of the Agricultural Departments in the cotton growing provinces and Indian States. Though, as a matter of convenience, the Committee has laid down certain lines of demarcation regarding the investigations which it considers appropriate for its grants, the general policy is to give assistance in the directions where it is most needed in the carrying out of a co-ordinated policy of cotton improvement. The Committee realised at the outset that the production of a better variety of cotton will not alone solve the entire cotton problem and that improvement in the science and practice of agriculture must go hand in hand with improvement in the method of disposal of the produce if permanent success is to be achieved. With full appreciation of these and other factors, much attention has been devoted by the Committee to the improvement of primary cotton marketing, to the prevention of adulteration and other abuses, and to many other problems connected with the cotton trade of the country. The success achieved in these directions has indeed been very marked. Legislation for the establishment of regulated cotton markets has been enacted in Bombay and the Central Provinces, while in Madras the establishment of regulated cotton markets is provided for under the Commercial Crops Markets Act. Hyderabad, Indore and some other Indian States have also passed similar legislation, and open markets have been established.

2. PERSONNEL.

A list of the members constituting the Committee and the various interests they represent as on 31st August, 1940, is given in Appendix I. Under the Indian Cotton Cess Rules, members, who are not *ex-officio* members, hold office for three years and one-third of their number retire each year in rotation. The term of office of additional members appointed by the Governor-General in Council under Section 4(xi) of the Indian Cotton Cess Act is three years or such lesser period as may be specified in the notification of appointment.

3. ADMINISTRATION.

Mr. D. N. Mahta continued as Secretary of the Committee throughout the year. Mr. C. J. Bocarro, Assistant Secretary, was on leave for four months,

during which period Mr. Ajodhya Sahai, Superintendent of the Office, officiated as Assistant Secretary.

Dr. Nazir Ahmad continued as Director of the Technological Laboratory, except for a period of one month when he was on leave and Mr. D. L. Sen officiated as Director.

The financial position of the Committee continued to be satisfactory. Receipts during the year amounted to Rs. 9,27,770 and the total expenditure to Rs. 9,08,106. A statement showing the receipts and expenditure of the Committee and also the Balance Sheet for the year as at 31st March 1940 are given in Appendix II.

The following places were visited by the Secretary in connection with the research, seed distribution and other schemes of the Committee :—

Poona, Surat, Indore, Nagpur, Delhi, Baroda, and Coimbatore.

4. SUB-COMMITTEES.

Most of the detailed work of the Committee is carried on with the help of Sub-Committees, appointed annually, which hold office from the 1st April. This arrangement not only effects a considerable saving in time in the disposal of business which otherwise would have to remain pending till one of the half-yearly meetings of the Central Committee, but also lightens the task of that body.

The principal executive body of the Committee is the *Standing Finance Sub-Committee* which exercises its powers under Rule 10(2) of the Indian Cotton Cess Rules. It is a statutory Sub-Committee consisting of nine members, including the President and the Vice-President who are *ex-officio* members, the Vice-President being the *ex-officio* Chairman. By resolution of the Committee, one of the members of this Sub-Committee must be a representative of cotton growers and one an Agricultural Officer. Subject to such restrictions as may be at any time imposed by the Committee, the Finance Sub-Committee exercises all the powers of the Committee in regard to the control and disposal of the funds of the Committee and such other powers as may be delegated to it. The members of this Sub-Committee during the period under review were :—Sir Chunilal V. Mehta, (Vice-President), Chairman ; Mr. P. M. Kharegat, (*ex-officio*) ; Sir Purshotamdas Thakurdas ; Mr. S. D. Saklatvala ; Mr. J. Vonesch ; Mr. W. J. Jenkins ; Mr. Chandulal P. Parikh ; Mr. Chunilal B. Mehta and Sardar Rao Bahadur Bhimbhai Ranchodji Naik.

The functions of the other Sub-Committees and their composition as on the 31st August 1940, are detailed below :—

Local Sub-Committee.—This Sub-Committee is concerned with matters of a general nature, not involving finance, which cannot be postponed for consideration to the usual half-yearly meetings of the full Committee. It is composed of local members and those residing within easy reach of Bombay. The members during the year under review were :—The President (Mr. P. M. Kharegat), The Vice-President (Sir Chunilal V. Mehta), Sir Purshotamdas Thakurdas, Mr. S. D. Saklatvala, Mr. Chunilal B. Mehta, Mr. J. Vonesch, Mr. L. F. H. Goodwin, Mr. Chandulal P. Parikh, Mr. W. J. Jenkins, Mr. A. P. Darlow, Sardar Rao Bahadur Bhimbhai R. Naik and Rao Bahadur Sir Madhaorao Deshpande. Six meetings of this Sub-Committee were held during the year.

Agricultural Research Sub-Committee.—As its name implies, this Sub-Committee is concerned with matters relating to the agricultural schemes financed by the Committee. It reviews the progress reports on and programmes of work of the Committee's research, seed distribution and marketing schemes and makes such observations on them as it considers necessary for their future conduct. It examines proposals for new schemes and extensions of old ones. The progress of the work done by the Committee's research students also comes under its scrutiny. It ordinarily assembles half-yearly, a day or two before the meetings of the Indian Central Cotton Committee.

The constitution of this Sub-Committee was laid down at the 10th meeting of the Indian Central Cotton Committee and additions have been made from time to time ; the members during the year were :—

I. *The President*—Mr. P. M. Kharegat (*ex-officio*),

II. *The Vice-President*
III. *The Co-operative Banking Representative.* } Sir Chunilal V. Mehta (*ex-officio*),

IV. *Cotton Growers' Representatives.*—Sir William Roberts, Sardar Rao Bahadur Bhimbhai Ranchodji Naik, Mr. Roger Thomas, Rao Bahadur Sir Madhaorao Deshpande,

V. *Cotton Trade Representatives.*—Sir Purshotamdas Thakurdas, Mr. Chunilal B. Mehta, Mr. Chandulal P. Parikh, Mr. J. Vonesch, Mr. L. F. H. Goodwin, Dr. Chellaram Shewaram,

VI. *Agricultural Officers.*—The Agricultural Commissioner with the Government of India (*ex-officio*), Mr. H. R. Stewart, Mr. W. J. Jenkins, Mr. A. R. C. Westlake, Mr. R. G. Allan, The Director, Institute of Plant Industry, Indore (*ex-officio*), Rao Saheb K. I. Thadani, Mr. Nizam-ud Din Hyder, Sardar D. K. Jadhav, Mr. Vishnu Sahay, Mr. J. C. McDougall, Mr. T. G. Rama Iyer,

VII. *Additional Members.*—Dewan Bahadur Sir T. Vijayaraghavacharya, Mr. Mohammad Afzal, Mr. K. Ramiah, Rai Saheb Kalidas Sawhney, Professor R. H. Dastur, Rao Bahadur V. Ramanatha Ayyar, Dr. B. L. Sethi, Dr. R. Sankaran, Mr. S. S. Pande,

VIII. The Secretary.

Technological Research Sub-Committee.—This Sub-Committee deals with matters relating to Technological Research. It was originally constituted at the January 1924 meeting of the Committee with the object of advising the Director of the Technological Laboratory on technical matters. It generally meets during the time of the half-yearly meetings of the full Committee. The following were the members of this Sub-Committee during the year under report :—The President—Mr. P. M. Kharegat (*ex-officio*), The Vice-President—Sir Chunilal V. Mehta (*ex-officio*), The Agricultural Commissioner with the Government of India (*ex-officio*), Sir Purshotamdas Thakurdas, Dewan Bahadur Sir T. Vijayaraghavacharya, Mr. S. D. Saklatvala, Mr. Chunilal B. Mehta, Sir William Roberts, Lala Shri Ram, Mr. H. R. Stewart, Mr. W. J. Jenkins, Mr. A. R. C. Westlake, Mr. Chandulal P. Parikh, Mr. L. F. H. Goodwin, Capt. S. R. Pocock, Mr. J. Venesch, Rao Saheb P. V. Deshmukh, Mr. E. F. G. Gilmore, Dr. Nazir Ahmad, Rao Bahadur V. Ramanatha Ayyar, Rai Saheb Kalidas Sawhney, Mr. Y. G. Deshpande, Dr. R. Sankaran, Dr. B. L. Sethi, Mr. F. F. Bignell and Mr. A. D. Walwyn (Representing the Bombay Millowners' Association), Seth Navnitlal Sakarlal and Seth Madan Mohan Mangaldas (Representing the Ahmedabad Millowners' Association), Mr. R. G. Saraiya and Mr. Jamnadas Ramdas (Representing the East India Cotton Association, Ltd.) and Mr. A. B. Kotak and Mr. R. T. Mirchandani (Representing the Karachi Cotton Association, Ltd.). Two meetings of this Sub-Committee were held during the year under review.

Wider Markets Sub-Committee.—This Sub-Committee was constituted by the Committee at its meeting held in August, 1933, for investigating the question of finding wider markets for Indian cotton. The members of this Sub-Committee during the year were :—The President (Mr. P. M. Kharegat), The Vice-President (Sir Chunilal V. Mehta), Sir Purshotamdas Thakurdas,

Dewan Bahadur Sir T. Vijayaraghavacharya, Mr. S. D. Saklatvala, Dr. W. Burns, Dr. T. E. Gregory, Mr. H. R. Stewart, Mr. W. J. Jenkins, Sir William Roberts, Sardar Rao Bahadur Bhimbhai Ranchodji Naik, Mr. Chandulal P. Parikh, Rao Saheb K. I. Thadani, Mr. Nizam-ud Din Hyder, Rao Saheb P. V. Deshmukh, Dr. Nazir Ahmad, Mr. R. G. Saraiya (additional member), Mr. Y. G. Deshpande, Rai Saheb Kalidas Sawhney, Mr. J. C. McDougall, Mr. Vishnu Sahay, Mr. V. Ramdas Pantulu, Mr. J. Vonesch and vacant (four seats).

Standards Sub-Committee.—Constituted in April, 1933, this Sub-Committee is responsible for the preparation for use in India of universal standards of certain growths of cotton dealt with in common both by the East India Cotton Association and the Karachi Cotton Association and of certain other varieties with which only the former Association is concerned. Six meetings were held during the year. The following were the members of this Sub-Committee during the period under review :—Mr. C. P. Bramble (Representing the Imperial Council of Agricultural Research), Mr. Haridas Madhavdas and Mr. Jamnadas Ramdas (Representing the East India Cotton Association), Mr. Hiranand P. Bhatia and Dr. Chellaram Shewaram (Representing the Karachi Cotton Association, Ltd.), Rao Bahadur Sir Madhaorao Deshpande and Mr. M. P. Kolhe (Representatives of Cotton Growers of Oomras Tract), Mr. Y. R. Joshi and Mr. A. J. Kapadia (Representatives of Cotton Growers of Broach Tract), Mr. Mulchand V. Shah and Mr. Bansilal Jivanlal Desai (Representatives of Cotton Growers of Dholleras Tract), Mr. F. B. Lokshmeshwar and Mr. S. B. Betgiri (Representatives of Cotton Growers of Kumpta Tract), Mr. Vadilal Chunilal Doshi and Mr. Hiralal H. Pandya (Representatives of Cotton Growers of Mathia Tract).

Cotton Forecast Sub-Committee.—Constituted by the Committee at its meeting held in February 1933, this Sub-Committee is concerned with matters connected with the improvement of the accuracy of cotton forecasts of India. It usually meets half-yearly, a day or two before the meetings of the full Committee. Two meetings of this Sub-Committee were held during the year under report. The composition of the Sub-Committee was as follows :—The President (*ex-officio*), The Vice-President, the Agricultural Commissioner with the Government of India (*ex-officio*), the Director-General of Commercial Intelligence and Statistics, the Director of Agriculture, Bombay Province, the Director of Agriculture, Punjab, the Director of Agriculture, Madras, the Director of Agriculture, United Provinces, the Director of Agriculture, Central Provinces and Berar, the Director of Agriculture, Sind, the Director of Agriculture, H.E.H. the Nizam's Government, the Commissioner of Agriculture,

Baroda, the Director of Statistics, H.E.H. the Nizam's Government, the Director of Land Records, Central Provinces and Berar, the Deputy Director of Statistics, Department of Commercial Intelligence and Statistics, the Statistical Officer, Department of Industries and Commerce, Madras, Dr. T. E. Gregory, Mr. J. Vonesch and Mr. L. F. H. Goodwin.

Research Students Selection Sub-Committee.—This Sub-Committee is concerned with the selection of students for scholarships or training grants for research in the several sciences relating to cotton. The members of this Sub-Committee during the year under review were :—The President—Mr. P. M. Kharegat, The Vice-President—Sir Chunilal V. Mehta, Dewan Bahadur Sir T. Vijayaraghavacharya, Dr. W. Burns, Dr. Nazir Ahmad, Mr. K. Ramiah and the Secretary.

Cotton Ginning and Pressing Factories Sub-Committee.—This Sub-Committee is appointed by statute to attend to matters arising out of the Cotton Ginning and Pressing Factories Act, 1925. One meeting of this Sub-Committee was held during the year under review.

The members of this Sub-Committee during the year were :—

The Vice-President,
The Co-operative Banking Representative,
Sir Purshotamdas Thakurdas,
} Sir Chunilal V. Mehta (*ex-officio*).
Mr. S. D. Saklatvala,
Mr. J. Vonesch,
Sir William Roberts,
Mr. W. J. Jenkins,
Rao Saheb P. V. Deshmukh,
Dr. Chellaram Shewaram,
Captain S. R. Pocock,
Vacant (three seats).

In addition to the above Sub-Committees, Special Sub-Committees are appointed from time to time to deal with specific matters which do not directly fall within the purview of any of the other Sub-Committees. Two such Special Sub-Committees, *viz.*, (*i*) Special Sub-Committee on Crop Cutting Experiments on Cotton, and (*ii*) Special Sub-Committee on the Institute of Plant Industry, Indore, were appointed during the year.

The functions of the first Sub-Committee were to examine and report on the replies received from the Provinces and States on the proposed co-ordinated scheme of crop-cutting experiments on cotton on an all-India basis.

The object of this scheme is to obtain, as early as possible, reliable standard yield figures for cotton which would be of material assistance in the preparation of the cotton forecasts. The report of this Special Sub-Committee and the decision of the Committee thereon are dealt with under "Cotton Statistics".

The second Special Sub-Committee, consisting of the Vice-President, Sir Purshotamdas Thakurdas, Dr. W. Burns, Mr. W. J. Jenkins, Mr. P. H. Rama Reddi, Rai Saheb Kalidas Sawhney and the Secretary, was appointed to examine the past and present working of the Institute of Plant Industry, Indore, and to make recommendations for its future organisation. This Sub-Committee met on the 22nd September, 1939, and examined the position with special reference to the following points :—

(1) Whether the Committee was getting adequate return for the money it was spending on the Institute.

(2) Whether fundamental research of the kind carried out at Indore was a necessary part of the work of the Indian Central Cotton Committee and whether, if such research were not done, the work of the Committee would be incomplete or handicapped in any way.

(3) Whether Indore was a suitable place for research on cotton and, if so, whether this work could not be carried out on more economical lines than had been the case in the past.

As regards the first point, the opinion was unanimous that the results obtained had not been commensurate with the amount of money spent by the Committee. On the second point, the opinion of the expert members of the Sub-Committee was that a Central Research Institute for fundamental research on genetics and plant physiology was desirable and that discontinuance of the research on these subjects would render the work of the Committee incomplete to that extent. The Sub-Committee laid emphasis on the fact that plant breeding in India has now reached a stage when fundamental genetical work is necessary to help the plant breeder in determining the characters of the plant, etc. On the last point, *viz.*, whether Indore is a suitable location for research on cotton, the Sub-Committee drew attention to the very good work on genetics done by Mr. Hutchinson at Indore, and expressed the view that it should be possible to produce similar work in the future. The general opinion of the Sub-Committee was that, although Coimbatore was perhaps in some ways a more suitable place, the handicaps imposed by wilt and frost and the inability of Indore to successfully raise

all the types of cotton grown in India, were at present not sufficient reasons to warrant the location of the fundamental research on cotton being shifted elsewhere. The Sub-Committee was, however, unanimously of the opinion that this work should be separated from the plant breeding, extension and other work of the Institute and treated as a separate scheme—Cotton Genetics Research Scheme—under the direct control of the Committee. It further recommended that the programme of work should be confined to genetical investigations, methods of sampling, field plot technique, statistical investigations in relation to genetics, *etc.*, that the Geneticist should be directly responsible to the Committee for the working of the scheme which should be financed entirely by the Committee and that the Board of Governors should be requested to place at the disposal of the Geneticist the necessary accommodation and land required for his work. The Sub-Committee was unanimously of the opinion that the Committee should limit its grant to the Institute for plant breeding and other work to Rs. 30,000, the contribution from the States being estimated at Rs. 40,000 per annum. With regard to the representation of the Committee on the Board of Governors, the Sub-Committee recommended that this should be on the existing lines, *i.e.*, in proportion to the contribution made by the Committee, the grant for Cotton Genetics Research Scheme not being taken into account for purposes of assessing representation. The Sub-Committee suggested further that the usual plant breeding work on cotton and other crops, as well as seed multiplication, distribution and demonstration work and such agronomical and chemical work as might be considered desirable to continue for the benefit of the States, should be controlled by the Board of Governors and financed by the contributions made by the States and the Indian Central Cotton Committee.

The above recommendations of the Special Sub-Committee were accepted by the Indian Central Cotton Committee and the new arrangement came into force from 1st April, 1940.

During the period under review, the following members represented the Committee on the Board of Governors of the Institute of Plant Industry, Indore :—

The President,
The Vice-President,
Mr. W. J. Jenkins, and
The Secretary.

Mr. H. Sitarama Reddy represented the Committee on the Imperial Council of Agricultural Research. Under Article 51, as amended, of the Articles of Association of the East India Cotton Association, the Committee is entitled

to nominate, from amongst the growers' representatives, three persons, whether members of the Association or not, not having dealings in forward contracts, as Directors of the Association. Sardar Bahadur Gurbachan Singh, Mr. H. Sitarama Reddy and Sardar Rao Bahadur Bhimbhai R. Naik were appointed by the Committee for the cotton year 1939-40.

The Committee is an Associate Member of the International Federation of Master Cotton Spinners' and Manufacturers' Associations.

5. PROVINCIAL COTTON COMMITTEES.

The value of Provincial Cotton Committees in dealing with problems of provincial and local importance has been stressed in previous reports; it is evident that such problems can be visualised best by those on the spot, and from this aspect the views of Provincial Cotton Committees are of much value in aiding the Indian Central Cotton Committee to arrive at decisions on the matters submitted for its consideration. The Committee is pleased to note that in those Provinces where Provincial Cotton Committees have been actively functioning, the work done by them has proved to be of material benefit to the Governments concerned.

6. MEETINGS.

Two meetings of the Indian Central Cotton Committee were held during the year under review. The first, at the invitation of the Government of Madras, was held at Coimbatore on the 19th and 20th January 1940. This was the fourth meeting of the Committee to be held outside Bombay, the previous three being held at Indore, Karachi and Lyallpur. The object of holding meetings of the Committee away from its headquarters at Bombay is to afford the members an opportunity of seeing for themselves the work in progress on schemes financed by it. An important resolution passed by the Committee at this meeting at which Mr. D. N. Strathie, Adviser to His Excellency the Governor of Madras, was present, is given below :—

> " The Indian Central Cotton Committee observes that in spite of the availability of improved strains of cotton suited for most of the cotton growing tracts in the Madras Presidency, the area yet to be covered by these strains remains very large. This seems to be due to want of adequate funds and suitable organisation to undertake the work of seed distribution. The Committee, therefore, recommends to the Madras Government that steps be taken to provide adequate funds and to make all facilities available to the Agricultural Department and non-official agencies like Rural Co-operative Societies for the production and distribution of large quantities of improved pure strains in order that the whole cotton growing area may be covered by them as quickly as possible."

The second meeting of the year was held at Bombay on the 8th and 9th August, 1940. This was the usual monsoon meeting at which the progress reports on the various schemes financed by the Committee and programmes of work are examined. Amongst these and other items, the position of Indian cotton, arising as a result of the shutting off of several European markets owing to the war, was discussed at some length at this meeting. Various remedies for meeting the situation were considered, the main suggestion being that an export organisation should be created in conjunction with the various Millowners' Associations for increasing the export of cloth of Indian manufacture outside India, as this was a suitable opportunity for establishing export markets for Indian piecegoods, and for ensuring a permanent increase in the use of Indian cotton in India itself. The desirability, in this connection, of sending a deputation, consisting of experts and representatives of the trade, to overseas markets with the object of finding out precisely the requirements of those markets for piecegoods and raw cotton, *etc.*, was stressed. It was finally agreed that the views of the various Millowners' Associations in India, as well as of the Chambers of Commerce, should be obtained regarding the desirability of setting up an export organisation for the purpose of developing and facilitating the export trade of this country.

CHAPTER II.

RESEARCH.

The research policy of the Committee was outlined in the previous report. Briefly, subsidies are granted to Departments of Agriculture in the various cotton growing provinces and Indian States for specific investigations on cotton. These investigations include botanical schemes for breeding high yielding superior types of cotton, entomological schemes for the study of the life history of certain cotton pests and measures to combat them, mycological schemes for ascertaining ways and means to prevent loss due to fungoid diseases and physiological schemes for the study of crop growth and causes of bud and boll shedding. Until 1937, the entire expenditure on these schemes was borne by the Indian Central Cotton Committee, but, in view of the gradual depletion of its reserves owing to the annual expenditure exceeding the income, it was decided that the Provincial Governments, in future, should accept increasing responsibility for such of the schemes financed by the Committee as at the end of their sanctioned period were found to have produced results of definite value, in order that the savings thus effected might be released for utilisation by the Committee for extending its activities in other useful directions. The Provincial Governments and States have since been bearing an increasing share of expenditure on the schemes of the Committee. The policy in this connection is that research schemes are financed in full by the Committee up to a period of ten years, subject to review at the end of 3rd, 5th and 8th year. To justify further financial help from the Committee after this period, special technical or scientific reasons are necessary, particularly if the Committee's share is to exceed 50% of the total expenditure to which it is normally limited. Expenditure on seed schemes is divided into (1) cost of staff and (2) incidental charges on the distribution of seed of approved varieties less receipts, if any. The Committee bears either the cost of staff or the incidental expenditure, but not both. Seed schemes are sanctioned by the Committee for periods not exceeding five years, in the first instance, but they may be extended subsequently for a further period of five years on the condition that (*a*) the Committee's share of the expenditure in the second period should not exceed 75% either of the pay of the staff or incidental expenditure and (*b*) that the local Government concerned contributes not less than the sum spent during the original period of the scheme. It is not necessary, however, that the grant for the renewal

period should be less than for the first sanctioned period, but the Committee's contribution should not exceed 75%. When a change in the variety under distribution is made with the approval of the Indian Central Cotton Committee, further continuance of the scheme is treated as a new seed distribution scheme and not as a renewal of the original scheme. After a seed distribution scheme has been in operation for a period of ten years, the contribution of the Committee, during the next five years, is limited to 33% of the cost of the staff or incidental expenses, subject to a maximum of 15% of the total cost of the scheme during the extension period.

By means of progress reports and programmes of work, which are critically examined by Special Sub-Committees appointed for the purpose, a close touch is maintained with the work being done under the various schemes financed by the Committee. The procedure adopted is that, before being approved, all schemes are subjected to a thorough examination, first by Special Sub-Committees of the Agricultural Research Sub-Committee, then by the full Agricultural Research Sub-Committee, and finally by the Indian Central Cotton Committee, subject to the financial aspect being further examined in detail by the Standing Finance Sub-Committee.

The Committee also gives grants to Agricultural Departments and Co-operative Sale Societies (through Agricultural Departments) for the extension and marketing of improved varieties of cotton and the maintenance of nuclei of pure seed of approved strains of cotton for which, for the time being, there is no seed distribution scheme in operation. Whenever necessary, scholarships and training grants are also sanctioned for post-graduate training in subjects pertaining to various aspects of cotton, the selected candidate being sent abroad for the requisite training in the absence of adequate facilities being available in India.

During the year under report, there were 36 research schemes, 16 seed extension schemes, 2 marketing schemes and 4 nuclei schemes in operation, the total estimated cost of these being Rs. 5,09,861. In addition, Rs. 2,11,544 and Rs. 1,11,000, respectively, were sanctioned for the work being done at the Committee's Technological Laboratory, Matunga, and at the Institute of Plant Industry, Indore. The research work carried out under the auspices of the Committee during the year under review is described below under (1) Fundamental Research, (2) Research on Cotton Technology and (3) Cotton Research in Provinces and States.

1. FUNDAMENTAL RESEARCH.

Fundamental research on cotton genetics, physiology and agronomy is conducted at the Institute of Plant Industry, Indore. This Institute was established in 1924 with the object of providing a central research station for cotton in the black soil area of the Malwa Plateau, and is maintained by annual contributions from the Committee on the one hand and the Member States in Central India and Rajputana on the other. The management of the Institute is vested in the Governing Body, representation on which, in any financial year, is proportionate to the grants made by the Committee and the Member States during the previous financial year. During the year ending 31st March, 1940, the Committee contributed Rs. 1,11,000 and the Member States in Central India and Rajputana Rs. 35,460. As stated in Chapter I, the working of the Institute was re-organised during the year and the new arrangement came into force with effect from the 1st April, 1940. Under this, fundamental research on genetics and plant physiology has been separated from the plant breeding, extension and other work of the Institute and treated as a separate scheme—Cotton Genetics Research Scheme—which is to be financed entirely and controlled directly by the Committee. The work of the Cotton Genetics Research Scheme will be concerned with genetical investigations, methods of sampling, field plot technique and statistical investigations in relation to genetics. The grant to the Institute proper will, in future, be limited to Rs. 30,000, the contribution from the States being estimated at Rs. 40,000 per annum. The Institute will be responsible for the usual plant breeding work on cotton and other crops for the Member States, as well as seed multiplication, distribution and demonstration work, and such agronomical and chemical investigations as might be considered desirable for the benefit of the States.

Mr. T. R. Low continued as Director of the Institute throughout the year and Mr. K. Ramiah assumed charge of the Cotton Genetics Research Scheme, Indore, with effect from the 1st April, 1940. Mr. Ramiah represented the Committee at the International Congress of Genetics, held at Edinburgh in August 1939. Mr. V. G. Panse, who was deputed by the Committee in September 1938 for advanced training in statistics under Prof. R. A. Fisher at the Galton Laboratory, University of London, returned in May 1940, after completion of his training, and assumed charge of his duties as Statistician, attached to the Cotton Genetics Research Scheme, Indore.

A brief review of the work done at the Institute during the year is given below: —

Cotton Genetics.—The cytogenetics of the sterile mutant isolated from the Million Dollar has been worked out and the results have shown that the

sterility is due to asynapsis caused by a single gene which freely assorts with genes *R*, *L* and *Y*.

Further work on the Punjab hairy lintless gene has shown that there is invariably a serious deficiency of the homozygous lintless class although at times a good 1 : 2 : 1 ratio of lintless : short linted : linted types does occur in crosses involving both related and unrelated backgrounds. The survival of the homozygous lintless appears to be due to some unaccountable behaviour of the homozygous lintless in the matter of viability which appears to vary from almost total failure to complete germination. Notes from other places like Coimbatore and Lyallpur have shown that the environment affects the viability of the seeds with the lintless gene differently. In all the places, however, the homozygous lintless type, whenever it occurs, is characterised by short internode, dwarfish habit and comparative lateness.

Further studies have been made with the genetics and interrelations of the *1027 A.L.F.* lintless gene Li_a. A cross with a *R* gene showed a free assortment giving a 9 : 3 : 3 : 1 ratio for the genes *R* and Li_a; another cross with the narrow *Kokati* showed a free assortment with the leaf shape gene *L*. A study of the back-crosses of the F_1s of the above cross (heterozygous for lint colour) with *1027 A.L.F.* lintless parent confirmed the independent assortment of the lintless gene with the lint colour gene *K*, whereas between *K* and *L* the usual linkage has been observed with about 32% crossing over.

The segregation results of the F_3 families of the cross 1027 lintless x Punjab glabrous lintless confirmed the complementary nature of the genes Li_b and Li_a. It may be mentioned that two linted plants occurred in an F_3 of a lintless plant from Nandyal lintless x Wagad lintless. A similar unexpected experience was met with in the progenies of the cross *1027 A.L.F.* x *Dharwar* glabrous lintless also. The occurrence of a small number of linted plants in the progenies of *herbaceum* lintless mutants has also been reported from Surat. Further work is, however, required before a suitable explanation can be offered.

The identification of a new member of the anthocyanin allelomorphic series in *Tellapatti* (*G. arboreum* var *neglectum* forma *indica*) reported last year has been confirmed from a study of the F_3 and backcross populations of all the crosses. A 1 : 2 : 1 ratio of red leaf spot, intermediate red leaf spot and green leaf spot was obtained in one complete F_2 of the cross, *Tellapatti* x *Malvi*. The F_2 families of the cross *Tellapatti* x *N6* selected for green leaf spot and ghost petal spot bred true in the F_3 generation ; so also the families with green leaf spot and petal spot (*Tellapatti* type). F_3 families with red leaf spot and full

petal spot segregated once again as in F_2. A study of the genetics of the petal colour was made on the crosses between a Chinese cotton type with a cream petal of the grade 5-6 darker than the cream (grade 2-3) and the three members of the allelomorphic series, *Y*, *Y*^{p} and *y*. The F_1 in all cases was *Y* of the grade (8-10) showing thereby the complementary nature of this new gene to both *Y*^{p} and *y*. The F_2s and backcross progenies will be followed up for confirmation of the results.

A virescent yellow mutant occurred last year in the X-rayed material and it is interesting to note that this mutant with the yellow colour, which is seen at all stages in the young leaves, has been found to be viable in contrast to the chlorophyll deficient mutant of *Malvi*. Its inheritance is still under study.

The types obtained from the X-rayed material referred to in the previous report with a significantly different node number and ginning percentage as compared to the control were tested in a replicated experiment during the year. Only *E. B. 31* and *M. U. 4* maintained the significant differences over control in node number and ginning percentage, respectively, whereas the significant differences in node number of *C. 402* and in ginning percentages of *M. 9-20* and *C. 402* observed last year disappeared this year.

Genetic Variability.—The data obtained from the experiments conducted at the Institute in connection with the statistical study of quantitative inheritance and genetic variability formed the basis of the investigations conducted by the Statistician under the guidance of Prof. R. A. Fisher in London.

The present investigation deals with the inheritance of staple length based on the data from the F_2 and F_3 progenies of the crosses between three strains of *G. arboreum* var *neglectum*—*Bani*, *Malvi* and *C. 520*.

It has been shown that the genetic portion of the F_2 variance can be estimated from the regression of F_3 progenies on their F_2 parents, as this regression co-efficient is an estimate of the ratio, *genetic variance/total variance in* F_2. This is an important result of direct value to the plant breeder. The smallness of the genetic fraction in the cross *Malvi* x *Bani* has confirmed once again the previous finding that *Malvi* and *Bani* are genetically more closely related.

To study the statistical properties of the populations following each of the genetic hypotheses and the effect of selection in these populations, statistical methods based on the moment-generating functions of multi-variate

distributions were developed and these would appear to form a powerful general approach to probelms on quantitative inheritance. By the application of these methods, certain statistical properties, such as the mean values, variances and covariances of F_3 progenies resulting from a portion of the F_2 population selected for the highest phenotypic values have been calculated. These theoretical values can be compared with actual values obtained from suitable experimental material in order to decide which of the hypotheses the experimental population follows most closely. They can also be used for studying the effect of selection in populations with different genetic constitutions.

Physiology.—An experiment was conducted during three previous years with two *Upland* cottons (from Dhar and Musakheri) to determine the effect of land on the quality of cotton. The crop was grown at Indore *barani* and at Kharua both *adhan* and *barani*. The results showed that the *adhan* land increases seed weight and that the effect is cumulative. In all the three years, the seed germinated better at Indore than at Kharua *adhan*. The *adhan* land appears to produce a larger proportion of immature seeds, which fail to germinate; the seeds, which germinate, produce more vigorous seedlings as a result of the greater seed vigour (shown in higher seed weight). The difference in the quality of cottons grown on *adhan* land and those grown on *barani* land is not so marked as in the previous year.

The study of the competition effect between the *Upland* and *desi* cottons was continued during the year. Investigations consisted of two experiments, one a repetition of last year's where *Malvi 9* was grown mixed with three cottons—another *Malvi* strain, *Verum* and an *Upland* strain—and the second experiment started for the first time, in which *Malvi 9* was grown mixed with 4 selected types of *Upland*. The results obtained were, however, contrary to those of the last year, demonstrating the effect of two extreme seasons, one with a high rainfall well distributed and another a droughty one with bad distribution. The first experiment would appear to indicate no material advantage in yield when *Malvi 9* is mixed with the two *desi* types. The technological tests on the mixture of the two types, however, again showed better fibre properties than the mean of the components and approached more nearly the better of the two components.

In the new experiment with mixtures of *Malvi 9* and four selected *Upland* types, Indore I, *M. U. 4*, *Buri 107* and *x4463*, due to the unfavourable season, the pure plots of *Upland* cottons yielded very low, whereas the mixtures were just as good as pure *Malvi 9*, except in the case of the mixture of *Malvi 9* with *Buri 107*. Observations were recorded on the incidence of red

leaf and leaf roll; while there were no differences in the incidence of red leaf between pure plots and mixtures, the incidence of leaf roll was always less in the mixture plots than in the pure plots and the differences were significant in the case of the two types *M. U. 4* and x*4463*, showing that these two benefit more than the other *Uplands* when grown mixed with *Malvi 9*.

The survival value of *Upland*, where it is grown mixed with *desi* in three different proportions, *viz.*, 75 : 25, 50 : 50 and 25 : 75, was studied during this year. The figures for the final stand showed that the initial proportions were maintained both in the good and bad land trials.

With a view to developing a suitable technique for propagating valuable plant-hybrids or polyploids by cuttings, a number of substances like B-indole-acetic acid, 'Hortomone A' and Seradix A were tried and it was found that the lowest concentration ($\frac{1}{2}$ A) of Seradix A induces a certain amount of rooting. When the cuttings were transplanted, however, they died out probably because all the available nutrition in the cuttings was exhausted by the time the roots formed. Satisfactory results were obtained when a modification was made by using culture solution (Tottingham) instead of water for diluting the hormone.

Experiments were also conducted with seeds, plumules of seedlings and growing tips of mature plants, to standardise the technique for obtaining the maximum amount of success in inducing polyploidy in cotton by the use of colchicine. The experiment with seed consisted of several combinations of treatments, 2 kinds of seed (dry and germinating), 4 different concentrations of colchicine (0.025, 0.05, 0.1 and 0.2%) and 4 different periods of soaking in the solution, (2, 4, 8 and 24 hours), besides the control. Dry seeds soaked in 0.1% solution for four to eight hours gave the best results. As colchicine produced greater mortality in the germinating than in the dry seeds, the latter gave a greater number of polyploids. There was a definite relation between concentration and duration of soaking, the lower concentration requiring a longer soaking and *vice-versa*. It was also observed that the germinating seeds require a higher concentration of colchicine to give the same results as the dry seeds. To test the effect on the plumule, seedlings, 4 to 6 days old, were treated with colchicine, in concentrations of 0.1, 0.2, 0.3, 0.4 and 0.5%, the solution being applied 4 to 6 times in the course of a day to the plumule with a camel hair brush. These trials revealed that seedlings treated with 0.2 to 0.3% concentration of colchicine gives the largest number of polyploids. Extensive experiments could not be made with growing buds of adult plants. Of the 6 tips that were treated, five did not show any effect and in only one case a boll set with a few seeds four months after the treatment.

The cytological work during the year was confined to the study of the interspecific crosses obtained from Surat and examination of chromosomes in colchicine treated plants. The number of chromosomes involved in the former was determined and reported last year. During the year, the meiotic behaviour of the chromosomes was completed and a full report on this is now under preparation.

Selection and Breeding.—The incidence of wilt was not quite so severe as in the past year, probably because the season was comparatively speaking somewhat dry. Attention is, at present, being concentrated on the breeding of a strain highly resistant to wilt to take the place of *Malvi 9*. The experiment reported last year in which the seeds collected from healthy and wilted plants separately were compared with regard to their disease transmitting nature was repeated during the year on wilt infected land. The indications from the two years' experiments are that the source of seed, whether from a wilted or wilt free plant, and the treatment of seed with sulphuric acid or formalin make no difference if the organism is already present in the soil, and that the seed from a resistant strain always gives less mortality irrespective of the source and treatment of the seed. The work on wilt is concentrated on the study of the most efficient and rapid methods of breeding wilt resistant cottons. Crosses have been made between *Malvi* and resistant types like *Jarila*, *Verum* and immune types developed at Poona. The different methods of breeding under study are (1) the replicated progeny rows, (2) the Svalov's method of selection and (3) growing progeny rows without replication on wilt-sick soil and testing the small bulks in a replicated trial later for wilt resistance, adjusted yield and seed cotton characters.

In addition to the hybrid material, strains with a high percentage of field resistance have been obtained by ordinary selection. In a varietal trial, six such selections were compared with *Malvi 9* in a wilt affected field during the year. Two of the selections showed a significantly higher survival than *Malvi 9*, and they were as good as *Malvi 9* in other agricultural characters such as yield, lint length and ginning percentage.

Varietal Trial—Malwa and Nimar.—The most promising selections from the previous year's trials were compared with *Malvi 9* and *Malvi 9-20* and *Jarila* at two centres in Malwa—Indore and Dhar. None of the new selections, however, was found to be better than *M. 9*. *Jarila* cotton was significantly poorer than the *Malvi* strains in the Indore trial, whilst in the Dhar trial it was as good as the *Malvi* strains. The performance of *Jarila*, however, requires to be further tested.

A number of the more promising selections in Nimari cotton, from the previous year's trials, were tested in Nimar; these included *Banilla*, *Jarila* and *Verum 434*. Significant differences were obtained only in respect of ginning percentage in which character *Banilla* and *Jarila* varieties were found to be outstanding. Though the yield behaviour of *Jarila* was not very convincing, it was better than the local in both lint length and ginning percentage. Gins, mills and cultivators have shown a preference for this cotton and the area under it is reported to be rapidly increasing.

In addition to the above trials, selection is also being continued in the acclimatised American cottons of Malwa. One of the selected strains, *M.U. 4*, has now reached a stage when it can be recommended for cultivation. This strain along with a sister strain, *Buri 107* from the Central Provinces and Berar, *Indore* I (an Upland strain that was distributed for cultivation in irrigated tracts of Rajputana) and 3 *Cambodia* crosses was tested at two centres, Indore and Badnawar in Dhar State. The results of this trial have brought out that the only cotton that compares favourably with *M.U. 4* is *Indore I*.

19 families of the fertile interspecies hybrids received from Surat were sown at Indore under pre-monsoon conditions on irrigated land. Most of the plants proved to be late for Malwa conditions and some selections have been made for trial in the ensuing year.

Seed Multiplication and Distribution.—435 *maunds* of improved cotton seed (401 *maunds* of *Malvi 9* and 34 *maunds* of *Malvi 9-20*) were collected during the year, mainly from the seed multiplication area in the villages adjacent to the Institute; 10½ *maunds* were reserved for farm sowings, 257 *maunds* were distributed to the contributing States for multiplication, and the remaining quantity was given to the cultivators in the neighbouring villages. An area of nearly 600 acres under *Malvi 9* and *Malvi 9-20* in these villages is directly under the supervision of the Institute and periodical visits are paid to rogue the crop and to note the incidence of wilt in particular fields, so that when the cotton is brought to the farm by the cultivators, the produce from the wilt infected fields might be kept separate and not used for seed purposes. Of the 1939-40 crop, only the produce from the first and second pickings was bought by the Institute, the later pickings being taken by the cultivators directly to the local market with a certificate that the produce is from the crop raised from the seed supplied by the Institute. 602 *maunds* of *kapas* of *Malvi 9* and *M. 9-20* was brought and ginned at the Institute and 373 *maunds* of seed was reserved for distribution.

The Holkar State is, in addition, arranging for large scale multiplication and distribution of *M. 9* seed and, during the year, 216 *maunds* of *Malvi 9 kapas* was ginned for them at the Institute.

The technological tests on *Malvi 9* and *M. 9-20* show that they resemble each other closely in respect of fibre properties, waste losses, evenness and nep-piness of yarns, but *M. 9-20* gives, on the whole, somewhat stronger yarns than *M. 9*. This conclusion is corroborated by the mill tests which also show a small advantage in favour of *M. 9-20*.

2. RESEARCH ON COTTON TECHNOLOGY.

The Committee maintains a well-equipped Technological Laboratory where research on cotton technology is carried on. In addition, trained Technological Assistants are stationed at Lyallpur, Sakrand, Cawnpore, Surat, Dharwar, Coimbatore and Parbhani to help the cotton research officers in charge of Committee's research schemes in the provinces for the improvement of cotton. The Annual Report of the Technological Laboratory is issued as a separate publication, and here, therefore, only a brief summary of the work done is given.

Samples are tested at the Laboratory under the following groups :—(*a*) agricultural samples, (*b*) samples of standard Indian cottons, (*c*) trade samples and (*d*) technological samples. Agricultural samples represent either new or improved varieties under trial by Agricultural Departments or old types grown in connection with certain field experiments. The number of samples received under this head, during the year under review, was 342 against 305 in the previous year. The samples of standard Indian cottons mostly represent improved varieties grown on a commercial scale. During the year, tests under this head were done on *Verum 262*, (Nagpur), *Late Verum* (Nagpur), *V. 434* (Akola), *Verum 262* (Akola), and *Umri Bani*, and the results were published as usual. The trade samples fall under two heads :—(*i*) those supplied by the East India Cotton Association, representing the fair average quality of different varieties of Indian cotton which form the bulk of the cotton crop, and (*ii*) those supplied under arrangement with the Bombay and Ahmedabad Millowners' Associations, representing the early arrivals of the various Indian cottons in the local markets. Altogether ten samples of the first category and 11 of the second were tested during the year and the results were published in circulars which were distributed to the trade and industry.

The total number of samples received at the Laboratory for various tests during the year was 768, showing an increase of 21% over those of last year and 120% over the average of the last ten years. The increase was due not

merely to the development of the Laboratory's older activities, but also to the inauguration of new activities such as the Testing House. The various cotton firms and mills are beginning to take advantage of the facilities provided by the Laboratory to an increasing extent. With the installation of a de-humidifying plant, the temperature and humidity in the spinning and the testing rooms can now be maintained at a uniform level throughout the year, regardless of the atmospheric conditions prevailing outside.

Among the agricultural samples tested during the year were: *Hyderabad-Gaorani* and *Bani 306*, grown in the *kharif* season in parts of Raichur district possessing chalka (granite) soil; *Segregate 8-1*, which is a promising cross between *1027 A.L.F.* and *1A Long Boll*; *Punjab-American 289-F*, grown in Bengal, and Garo Hill cotton, grown in Assam. The fibre-weight per inch of Garo Hill cotton, of which the lint is short and very coarse, was probably the highest recorded in the Laboratory. Owing to its rough feel and high fibre-weight per inch, this cotton is well suited for mixing with short staple wool or for such other non-textile purposes as the manufacture of gun cotton and hospital lint, etc.

During the period under review, a formula was evolved for predicting the single-thread strength of any specified count from the known strength of a count. The investigation on the effect of different treatments of kier boil and bleach on the quality of yarns spun from Indian cottons, undertaken jointly with the Department of Chemical Technology of Bombay University, was completed and an account of the first part of this investigation was sent for publication. Investigation of the spinning quality of mixtures made from Indian cottons and staple fibre, which was started sometime ago, was continued with special reference to the optimum conditions for processing such mixtures and brought near completion. The effect, on the spinning behaviour of Indian cottons and the quality of yarn, of using different beater speeds in the Crighton opener and the scutcher, of giving different numbers of treatments in these machines and of employing different sequences of machines in the blow-room was tested. The divergence between mill and Laboratory tests was studied by the carrying out of actual tests on the same cottons at the Laboratory and in three local mills. The results showed considerable variation from mill to mill, and, in view of this, it was decided to extend these tests to more Indian cottons and to a large number of samples. With a view to finding non-textile uses for Indian cottons, the possibilities of making cotton belting, artificial leather, cotton cloth for road construction, cotton cloth for use in place of hessian and cotton bags for sugar, flour and cereals, are being examined at the Laboratory.

Fifteen samples of linters of the 1938-39 crop and 23 samples of 1939-40 crop were subjected to mechanical and chemical analysis, and have also been graded against the official American standards of which a complete set was obtained for this purpose. The preliminary examination of the data has shown that, as compared with the 1938-39 crop, a considerable improvement is noticeable in the quality of linters of the 1939-40 crop.

Most of the machinery for the proposed ginning section was received during the year and will be erected as soon as the building for this section is completed.

3. COTTON RESEARCH IN PROVINCES AND STATES.

In the various cotton growing Provinces and States, the Committee finances several agricultural research schemes for the development and improvement of cotton growing. Some of these schemes are financed entirely by the Committee, while the cost of others is met partly by the Committee and partly by the Provincial Government concerned. The following paragraphs describe briefly the schemes in operation in the various provinces, their object and the progress made during the year under review.

(*i*) BOMBAY.

(a) Broach Cotton Breeding Scheme.—The Cotton Breeding Scheme at Broach was sanctioned in December 1931, for a period of five years, and came into operation in April 1932. In August 1936, it was extended for a further period of five years. The original object of this scheme was to obtain, by selection or hybridization, suitable types of cotton possessing wilt-resistant, high yielding, high ginning and superior spinning qualities, to replace the local mixture, a large proportion of which consisted of *Goghari*, a short staple, high ginning (40%) variety. In view, however, of the Committee's policy to replace, wherever possible, short staple with medium and long staple cottons, attention is now being concentrated on wilt resistance, high yield and fibre length.

The breeding of wilt-resistant types originally formed part of the Broach and Jalgaon Cotton Breeding Schemes but, as it was considered desirable that the testing of cotton strains should be done under the optimum conditions of wilt infection, and, as experience showed that these conditions, especially soil temperature in pots, were difficult to maintain at Broach and Jalgaon, the work was transferred to Poona in June 1935.

In August 1936, the wilt part of the two schemes was extended for a period of five years from the 1st April, 1937, and it was decided that it should be treated as a separate scheme from the 1st April, 1937.

The progress made during the year in connection with the breeding work at Broach and the Wilt Breeding Scheme at Poona is given below :—

11 segregates, *viz.*, 7 from the original lot of 14 mentioned in the last year's report, and 4 new ones—two from (*B. D. 8*×*G. A. 26*)×*B. D. 8*, one from each of the crosses (*B. D. 8*×*S. 7-1*) and *B. D. 8*×(*B. D. 8*×*S. 12-1*)—were tried in replicated plots. From the trials of the single plant progenies of the 4 new segregates, both in wilt-infected and wilt-free soils, it was found that *Segregates 3-1* and *7-29* were promising in respect of resistance to wilt, yield of seed cotton per acre, ginning percentage and fibre length.

The progeny bulk trials of the 11 segregates in wilt-free soil showed that while the average fibre length of all was equal to that of *B. D. 8*, only *Segregates 1-6* and *5-18* were definitely superior to the local variety in ginning outturn. The spinning test results of the previous two seasons have shown that all the segregates possess qualities for high spinning, above 37 highest standard warp counts against 16's of the local variety. *Segregate 1-6* gave appreciably more yield than the local variety and in ginning outturn it has proved to be the best strain. Absence of any mortality and only partial wilting during the last three seasons, even when grown in a thoroughly wilt-infected plot, indicate that all the segregates are as resistant as *B. D. 8* under field conditions.

Under the wilt breeding part of this scheme, the object is to evolve a cent percent wilt-resistant type from the material available at Broach. It is hoped that some cultures of *B.D. 8*, *viz.*, *B.D. 8-B*$_4$ and *B.D. 8-B*$_7$, will ultimately attain homozygosity for 100 per cent wilt resistance. The progenies of *N.S. 12* are still segregating and further tests will be continued. The back-cross, (*B.D. 8*×*G.A. 26*) × *B.D. 8*, continued to show a very high degree of wilt resistance and there are indications that 100 per cent. wilt resistant cultures may be obtained. The cross (*B.D. 8* × *N.S. 12*) and the back-cross with *B.D. 8* have also shown a very high degree of wilt-resistance and are rapidly approaching homozygosity as regards complete resistance. In the Russian *herbaceums*, the culture *2761-1* was found to be completely free from wilt. The cross (*B.D. 8*×*S. 7-1*) F_3 and the back-cross {(*B.D. 8* × *S. 12-1*) × *B.D. 8*} F_3 have also shown almost complete resistance to wilt.

A nucleus of pure seed of *B.D. 8* strain which is being distributed in the district since 1935-36 was maintained.

(b) **Jalgaon Cotton Breeding Scheme.**—This scheme was sanctioned in December 1931 for a period of 5 years and started work in April 1932. It was extended in August 1936 for a further period of 5 years. The original object of this scheme was to obtain, by selection or hybridisation, suitable wilt-resistant types with heavy yielding, high ginning and good spinning qualities, to replace the local mixture of *N.R.* and *Banilla* cottons in Khandesh. Wilt breeding work was originally included in the Broach and Jalgaon Cotton Breeding Schemes, but, in August 1936, it was decided that the wilt work should be treated as a separate scheme from the 1st April, 1937, and continued for a further period of five years.

The 120 plant selections of Dokras cotton from Chandur mentioned in the last year's report were increased to 121 and tested in line cultures for their economic characters and resistance to wilt. Out of these, 23 were found to be superior to *Jarila* in ginning percentage and either equal or superior to it in staple length. Three of the best plants from each of these lines will be tested for yield and resistance to wilt during the ensuing year. With the object of incorporating into *Jarila* the high ginning percentage of *N.R.* and cent percent wilt resistance of the *New Million Dollar*, the following cross was made :—

$$(\{Jarila \times N.R.5)\ F_1 \times New\ Million\ Dollar\}\ F_1.$$

From the large number of segregates tested, 124 plants, with a staple length of 24—27.6 mm. and a ginning percentage ranging from 39 to 45.2 coupled with wilt resistance, have been selected for tests during the ensuing year. The F_1 plants of the cross—*Jarila* × *New Million Dollar*—made with the same object as above, were back-crossed with *Jarila* and the seeds obtained from this material will be grown in wilt-infected plot during the coming year.

The F_2 of the cross—*Jarila* × *N.R. 5*—was examined to see whether any segregate combining the economic characters of *Jarila* and the higher ginning of *N.R. 5* could be isolated. Out of 741 plants of this cross, which were under observation, 36 plants, possessing a staple length of 23.6 to 26.4 mm. and a ginning percentage of 39—44.7 were finally selected for trial.

Six plants selected from three sub-cultures of *Jarila* have been sent to Poona for complete elimination of the susceptibles.

In the trials of *Jarila* and local cotton, conducted at 36 centres in Khandesh and a part of Nasik district, *Jarila* gave higher yields than the local in 20 centres, lower in 7 and equal in the remaining 9. The ginning percentage of *Jarila* ranged from 32 to 35.5.

Jarila, *Banilla* and *N.R. 6* were tested for yield at Jalgaon, Bhadgaon and Dhulia farms. *Jarila* gave significantly higher yield than *N.R. 6* at Bhadgaon and *N. R. 6* and *Banilla* at Dhulia. The samples of *Jarila* from these farms gave 26 to 30 highest standard warp counts. The lint was valued at Rs. 16 to Rs. 18 ' ON ' *Broach* at Ahmedabad and Rs. 52 to Rs. 60 over *Oomras* at Bombay. The premium realised at the auction sales ranged from Rs. 13 to Rs. 34 ' ON ' *Broach*.

200 lbs. of selfed seed were obtained from the nucleus of pure seed maintained at Jalgaon farm.

Work under the wilt breeding section of this scheme conducted at Poona consisted of testing the selfed seed of *Million Dollar*, *New Million Dollar* and *Chinese R1 Spotless 51*, under optimum conditions of infection. Tests over a series of seasons have shown that these strains have now reached a stage when they may be said to be 100 per cent resistant to wilt.

Crosses between the Khandesh types and the resistant strains were tested to ascertain the degree of susceptibility and to study the inheritance of wilt resistance.

(c) **Scheme for breeding wilt-resistant cottons in Surat area.**—This scheme was sanctioned by the Committee in August 1936 and commenced work in April 1937. The object of the scheme is to obtain a strain of cotton completely resistant to wilt and suited to the natural conditions obtaining in the Surat tract. This is sought to be achieved either by selection in *1027 A.L.F.* or by crossing this cotton with *B.D. 8* or other wilt resistant strains.

The testing work during the year was carried out in the wilt-infected plot at Shera.

The progenies of 12 plants of *1027 A.L.F.* selected for wilt resistance at Surat and tested at Shera gave three cultures with nil mortality, although they still showed partial wilting. It is proposed to continue the study of two of these cultures, *viz.*, *63-36* and *66-274*, which possess high ginning and long staple qualities.

The F_1 populations of the following four crosses were tested for wilt resistance ; no mortality was recorded in 1, 2 and 4 and only partial wilting ranging from 2.8% to 45.7% was observed in 2, 3 and 4 :—

1. (*8-1* × *K.F.*)
2. (*8-1* × *B.D. 8*)
3. [*8-1* × {(*B.D. 8* × *G.A. 26*) × *B.D. 8*} F_6-*1-6*)] F_1.
4. [*1027 A.L.F.* × {(*B.D. 8* × *G.A. 26*) × *B.D. 8*} F_6-*1-6*] F_1.

8-1 × *K.F* alone was conspicuous by the absence of deaths and even partial wilting.

The absence of mortality from wilt in a population of 107 plants, obtained from a resistant selection of *Segregate 8-1*, indicates that the latter is probably pure for resistance.

(d) Scheme for improvement of Wagad cotton at Viramgam and Jagudan.—While examining the possibility of growing medium and long staple cottons in the short staple areas of India, the Committee, in August 1935, decided that, in view of the absence of any serious attempt to improve the cotton of the large *Dholleras* tract, a comparative study of Indian and Iranian *herbaceum* cottons should be undertaken, with the object of finding out one or more suitable types for the tract. A special officer from the Institute of Plant Industry, Indore, was deputed to Iran to collect *herbaceum* types of cotton grown there and, in August 1936, a five-year scheme was sanctioned for the improvement of *Wagad* and *Mathio* cottons, the work on *Wagad* cottons being centred at Viramgam and that of *Mathio* at Amreli. Simultaneously, a small immune area was maintained at Jagudan under irrigation to safeguard the work at Viramgam.

The objects are the improvement of the Wagad cottons for (*a*) quality and yield and (*b*) earliness in order to escape frost, and the replacement, if possible, of the inferior *Mathio* cotton of Kathiawar by early *herbaceum*. These are sought to be achieved by (*a*) selection in Wagad cotton, (*b*) hybridisation with Surti-Broach quality cottons like *1027 A. L. F.* and *B. D. 8* and (*c*) hybridisation with Iranian *herbaceums* known to be early and of better quality.

During the year under review, unit selections were made from 17 families of the local *Wagad* for yield, ginning percentage and lint length. From 5

bulk samples of *Wagad* cotton received from Cutch, 32 plants, with high ginning (36—43%) and better staple (19—22mm.), have been selected for further study.

2 cultures—*H. S. 12-1* and *H. S. B-1*—one from each of the crosses, *viz.*, (*W. 8* × *B.D. 8*) and (*W26-2* × *1027 A.L.F.*), respectively, were compared with local *Wagad*, *Wagad 8* and *Segregate 4-1* under rainfed conditions. H. S. B-1 alone appeared to be promising. In another trial under irrigated conditions, *N 87-2*, *N 89-2* and *H.S.B-1* showed a significant increase in yield over Wagad *8* and *N 89-2* and *H.S.B-1* seemed to thrive equally well under dry and irrigated conditions.

A large number of crosses between *Wagad 8* and Russian, Persian, East Iranian and early *herbaceums* were made with the object of evolving early maturing types possessing better feel, long and fine staple and wide boll opening.

Varietal trials of *Wagad 8*, *Segregate 4-1* and local *Wagad* conducted over the last seven years have shown that *Segregate 4-1* is superior to local *Wagad* and *Wagad 8* in ginning and equal to *Wagad 8* in lint yield.

At Jagudan, varietal trials with *Wagad 8*, local *Wagad* and *Segregate 4-1*, conducted over the last 3 years, have shown that *Wagad 8* and *Segregate 4-1* are not superior to local *Wagad*.

Selection was carried out in crosses between *Wagad 8* and Russian, Persian and East Iranian cottons from Viramgam, with a view to evolving an early type which would escape frost.

(e) **Plant Puller Propaganda Scheme in Surat, Broach and Panch Mahals Districts.**—This scheme, which has for its object the eradication of the spotted bollworm by the uprooting of cotton stalks by means of plant pullers, was sanctioned in August 1933.

The year under review is the sixth year in which propaganda was carried out in the districts of Surat and part of Broach where a thorough clean-up campaign was not previously carried out. Intensive propaganda was conducted in Jambusar taluka of the Broach district where the campaign had not hitherto made good progress. In Surat district, the work was concentrated in the three talukas of Ankleshwar, Olpad and Chorashi where the practice has found favour with the cultivators. Propaganda in remaining talukas of Surat district was, however, not neglected. During the year, 680 plant pullers were sold in the area north of the river Narmada and 1552 in the tract south of it. It is reported that nearly 10,000 plant pullers have been

supplied by the Department to cultivators in Surat area excluding those purchased by the people direct. The percentage of the area cleaned up before the 15th May, 1940 with plant puller in Jambusar taluka was 92%, 98% in Broach and 95% in Vagra. The percentage of uprooting in Jambusar was 50 while in the three talukas of Ankleswar, Olpad and Chorashi the area uprooted was 49, 70 and 66%, respectively, as against 44, 65 and 61% in the previous year.

(f) **Scheme for inclusion of Northerns and Westerns cottons in programme of work of Dry Farming Scheme at Bijapur.**—This scheme was sanctioned by the Committee in August 1936, and is the outcome of the recommendations of the Agricultural Research Sub-Committee, which, while considering the subject of the possibility of growing long and medium staple cottons in the short staple cotton areas of India, expressed the view that in short staple cotton areas like the Bijapur district in the Bombay Province and Raichur and Gulbarga districts in the Hyderabad State, where the rainfall is limited and precarious, a solution of the problem confronting the successful growing of medium and long staple cottons might be found in devising suitable dry farming methods. The scheme came into operation in June 1937.

The season during the year under report was an average one from the point of rainfall. The work under the scheme was divided into two parts. In the first part, six replicated and randomised experiments were laid out to test the comparative performance of the four strains, *viz.*, *N. 14*, *H. 1. Jayawant* and the local *Kumpta*, and the effect on them of F. Y. M. and castor cake. The other five experiments were laid down to assess the value of different operations and treatments included in the Bombay Dry Farming method, *viz.*, tillage, bunding, interculture, spacing, rotation, fallowing and green manuring.

In the second part, *Northerns* and *Westerns* cottons were tried on a field scale under the Bombay Dry Farming method for comparison with the local cultivators' method.

Experiment 1 which was laid down to test the comparative performance of varieties supplemented by manures gave significantly different yields. *Local Kumpta* and *Jayawant* were distinctly superior to *N. 14*. *H. 1* gave higher yield than *N. 14*. F.Y.M. and castor cake gave significantly higher yields than the unmanured plots.

Experiment 2 was laid out with the object of ascertaining the advantages of three different types of preparatory tillage, *viz.*, ploughing, tine-tooth harrowing and blade harrowing. The results did not show any significant differences in yield.

Experiment 3 was designed to assess the value of bunding *versus* no bunding and the value of mulch over no mulch in bunded and non-bunded plots. The results were not significant.

Experiment 4 was laid down to determine the optimum plant population per unit area with different spacings. The results were not significant, but the largest yield was obtained with 18" × 12" spacing.

Experiment 5 was laid out to ascertain the advantage of rotating cotton with *jowar* over cotton year after year. The results were not significant though cotton after *jowar* gave 17% more yield during the year than cotton after cotton.

Experiment 6 was designed to assess the value of fallows, *viz.*, (1) clean fallow in the previous year followed by cotton, (2) cover fallow, *i.e.*, *sann* green manured fallow in the previous year followed by cotton and (3) cotton followed by cotton. None of the treatments was found to be significantly superior to the other two, though numbers 1 and 2 gave respectively 20 and 23% more yield than No. 3.

In the large scale field trials of *Northerns* and *Westerns* under the Bombay Dry Farming method, the highest yield was obtained when all the six treatments, *viz.*, ploughing, bunding, manuring and harrowing, wide spacing and greater numbers of intercultures, were included. Addition of F. Y. M. resulted in increasing the yield of the two cottons as compared to the local cultivator's method.

(*g*) **Scheme for interspecific hybridisation in cottons at Surat.**—This scheme was sanctioned by the Committee in January 1938, for a period of five years, with the object of obtaining, if possible, fully fertile hybrids between Asiatic and American cottons, combining the useful agronomic characters of both, particularly, the good staple length of the American and hardiness and adaptability to Indian climate of the Asiatics.

Prior to the commencement of the scheme, work on crossing Asiatic and American cottons was undertaken at Surat in 1932, with the result that 23 hybrids had been obtained, in which the American parents used were mostly of the acclimatised *Upland* from different parts of India, while the Asiatic parents were forms of G. *herbaceum* and G. *arboreum*. The hybrids produced from these were, however, sterile and efforts to induce fertility in them were successful only when they were back-crossed to American types. As a result, 27 first back-cross plants were raised successfully, 15 of which were found to

be more or less fertile. By crossing *Co. 2* (*G. hirsutum*) with Red *arboreum* (*G. arboreum*) and back-crossing the F1 to *Co. 2*, one plant, *viz.*, *B.C. No. 22*, was obtained, which was found to be fully fertile, combining the characters of both the parents.

During the year under report, all the F1 hybrids and first back crosses were maintained as ratoons and propagated vegetatively by cuttings and graftings. The F1 hybrids, though vigorous and flowering profusely, were sterile and to bring about fertility in them, three methods were tried, *viz.*, (1) back-crossing, (2) physical treatment and, (3) chemical treatment. Nearly 2,25,000 flowers of the hybrid plants were back-crossed and 63 bolls with 64 seeds were obtained. The second method failed to give the desired results. The chemical treatment, known as the " Drop " method of applying colchicine to growing buds and tips of shoots was tried on the germinated seeds of the hybrids for a month ; 4 out of 17 sterile hybrids showed apparent signs of doubling of chromosomes.

Of the 8 fertile back-crosses of 1937-38 maintained as ratoons, one, No. 22 [(*Co. 2* × Red *arboreum*) F_1 × *Co.2*] F_1, appears promising in respect of fibre properties and selection is being made from the F_2 and F_3 generations. Of the six back-cross plants of 1938-39, one [(D.A. 2.6.5. × Gaorani 6) F_1 × D.A. 2.6.5.] F_1, has been found to give healthy and early selections in F_2 and these will be tested in the ensuing year. Of the 4,600 plants of the F_2 of B.C. [(*Co. 2* × Red *arboreum*) F_1 × *Co. 2*] F_1, which were under observation, 51 plants were selected for resistance to jassids and red-leaf blight. These selections gin 30% to 41%, possess staple length of 26 to 33 mm. and have a distinctly silky feel. From the 37 progenies of individual plant selections from F_2 of B.C. No. 22 [(*Co. 2* × Red *arboreum*) F_1 × *Co. 2*] F_2, 3 progenies—(family Nos. 7, 16 and 26)—were found to be superior in respect of fibre characteristics.

The cytological study at Indore of the original hybrids revealed that 21 of them were triploids with 36 chromosomes, one a tetroploid (2n=52) and one pentaploid (2n=65).

Cytological work is now under way.

(*ii*) SIND.

(a) **Scheme for Cotton Jassid Investigation.**—In Sind, jassid attack is most prevalent in the south-east Tharparker district where it is proposed to establish a compact block of long staple cotton. One of the harmful effects of this pest is improper development of the seed, so that, in certain seasons,

good seed is not available for sowing purposes, and this gives a setback to the extension of improved varieties. Accordingly, in August 1937, the Committee sanctioned the above scheme, for a period of three years and six months, with the object of studying the habits of jassids, their alternative hosts and the manner in which certain varieties of cottons resist jassid attack. The progress made during the period under review is described below :—

The study of the incidence of jassid attack on different varieties of cotton was continued. This showed that the incidence was higher on *Sind Sudhar* and *4F-98* cotton than on *Punjab-American* and *Buri 107*, when sown on the same date; with different sowings, the earliest sown, irrespective of variety, was attacked the least. It was also observed that the jassid population in all varieties was insignificant during the month of May and the first fortnight of June, but increased in all during the 2nd fortnight of June. It was highest in the month of July in the April-sown cottons, whereas it reached the peak in the month of August in the May sown crop. From the point of view of yield, no definite conclusion could be drawn regarding the effect of the jassid population, varieties with smaller populations giving lower yields and *vice versa*. *M4* was found to be significantly superior to *Sind Sudhar*, *4F-98* *P. A.* and *Buri 107* at 1% level of significance. Of the two species of jassids met with on cotton in Sind, *Empoasca devastans dist.* had been found to predominate. These species had been found to live and breed on other host plants like Bhindi (*Hibiscus esculentus*), Brinjal (*Solanum melongina*), Potato (*Solanum tuberosum*), Phalsa (*Grewia asiatica*), Hollyhock (*Althea rosea*) and *Abutilon indicum*. Observations made on the nature of resistance to jassid showed that, although some jassid resistant varieties have been found to be typically very hairy on the undersurface of the leaves, all hairy varieties are not necessarily resistant. For instance, *4F-98*, which is exceedingly hairy, was found to be comparatively more susceptible to jassid attack. Hairiness, therefore, does not appear to be a reliable character in determining the resistance of a plant. It is thought, however, that resistance may be associated with the length, toughness and density of the hairs and this aspect will be studied in the coming year. Toughness of the leaf veins and thickness of the epidermis are two other characters which will be studied in this connection. It is proposed also to study the effect of such cultural practices as spacing, manuring and watering, etc., on the degree of resistance of the plant.

(b) **Scheme for investigation into Black-headed Cricket in Sind.**—This scheme was sanctioned by the Committee in January 1938, for a period of three years, with the object of establishing the identity of the pest and studying its life history, seasonal behaviour and the extent of the damage caused

by it. Before the opening of the Lloyd Barrage, the Black-headed Cricket had been known as an occasional pest of *Sorghum* and cotton in Upper Sind and some parts of the Punjab. With the introduction of cotton cultivation on the Right Bank of the Indus, however, this insect has become a serious pest of cotton in the seedling stage in Khirtar and Johi tracts in Sind and in some parts of Baluchistan. The pest appears in the cotton fields towards the end of April and disappears in June. The periods of its activity synchronises with the sowing time of cottons and causes almost wholesale destruction of the crop. The pest appears to belong to the same species as met with in Baluchistan, *viz.*, *Gryllulus domesticus*. The progress made during the year is described below :—

Four species of crickets have been found to attack cotton seed and seedlings. The commonest and the most virulent has been indentified as *Gryllulus domesticus Linn*, and is being studied in detail ; the duration of the various stages in its life cycle, seasonal behaviour, habitats and feeding habits have been studied. The pest was met with mostly in the nymphal stage of apparently the fourth or fifth instar and to a lower extent in the advanced nymphal instars. The adults were rarely seen. In nature, however, the various generations overlap and crickets of all stages are met with at the same time. The pest causes damage to cotton not only directly by destroying the seed and seedlings, but also indirectly by limiting the extension of the crop. The damage directly done to the cotton crop is estimated at one lakh of rupees during the year under report. The pest was found to attack the cotton crop in the months of May and June only ; during the rest of the year the number of crickets was insignificant.

(c) **Scheme for production of long staple cottons in Sind.**—Sind is the only Province in India which may be said to be suited for the production of long staple quality cottons of the Egyptian and Sea Island types. The failure to establish such cottons in the past has been largely due to inadequate water supply and lack of suitable acclimatised material. Since the inauguration of perennial irrigation under the Lloyd Barrage and Canals system, however, the chief obstacle in the development of long staple cottons in Sind has been removed and experience has shown that high yields can be obtained from such cottons under favourable climatic and soil conditions. Under adverse conditions, however, the yields obtained are low. This is probably due to extreme susceptibility of these cottons to environmental factors, such as, extremes of temperature, water deficiency in the soil, desiccating action of hot winds, etc. Although, therefore, some headway has been made, long staple quality cottons have not yet established themselves as major components

of the cotton crop in Sind. Ever since the opening of the Lloyd Barrage, however, the question of the establishment of a compact block of long staple cottons in Sind has engaged the attention of the Indian Central Cotton Committee. Although attempts in the introduction of long staple quality cottons in Sind, in the past, have not met with the success it was anticipated they would, the project, in the opinion of the Committee, nevertheless has possibilities which are well worth investigating. Accordingly, a five-year scheme for cotton breeding investigations for the production of long staple cottons for cultivation in Sind has been launched. The scheme came into operation in April 1940, and will be financed entirely by the Indian Central Cotton Committee, the Provincial Government providing the necessary land and buildings. With the approval of the Government of India, a sum of Rs. 2,01,690, spread over a period of 5 years, has been sanctioned for the scheme, and will be spent on the expert staff engaged, establishment and contingency charges (including purchase of necessary scientific apparatus and equipment). The experimental stations are situated at Mirpurkhas and Oderolal. The most important problem to be tackled is to see whether high quality cottons, preferably of the *289F* types, but possessing a better staple than *Sind Sudhar*, can be produced. The aim is to evolve a cotton longer than 1-1/16″ which would spin about 60 counts and yield not less than 6 *maunds* of seed cotton per acre. The more important items in the programme of work are :—(1) Production of hybrids, using the back-cross technique, between cottons of *289F* type and long staple cottons. (2) Testing of various selections from *289F*. (Experience has shown that conditions for growth of cottons of *289F* type are more favourable in Sind than in the Punjab). (3) Importation of fresh material from a wide range of places, such as, Egypt, Sudan, South Africa, U. S. A. and Brazil, etc., for acclimatisation, selection and for providing material for hybridisation purposes. (4) Working out a system of cultivation best suited for long staple cottons.

(*iii*) PUNJAB.

(a) **Punjab Botanical Scheme.**—This is one of the earliest schemes of the Committee. Sanctioned in 1923, for a period of five years, it came into operation in August 1925, and has been extended from time to time, the last extension, which will expire on the 28th February 1945, being approved by the Committee at its meeting held in January 1940. Upto 31st March, 1936, the cost of the scheme was borne in full by the Committee, but since then, the expenditure is shared on a 50 : 50 basis between the Committee and the Provincial Government. The original object of the scheme was to investigate the causes of the periodic failures of American cotton in the Canal

Colonies of the Punjab where a large area is annually grown under such cottons, and to obtain suitable types of American and *desi* cottons. In view, however, of the immediate economic importance of improved types of cotton, work was concentrated on breeding, and a separate physiological scheme was sanctioned for investigating the problem of periodic failures of American cotton. The Botanical scheme has thus been concerned mainly with the improvement of both *desi* and American cottons. As more than half the cotton area in the Punjab lies in the Canal Colonies, attention was first directed to the improvements of the cottons of that area. The South-Western tract of the Province comprising the arid districts of Multan, Muzaffargarh and Dera Ghazi Khan were given attention next and a sub-station for this purpose was opened at Multan in 1935. The first improved variety of American cotton to be given out for general distribution was *289-F/43* in 1934. The area under it, during 1939-40, was estimated to be some 170,000 acres including Bahawalpur State. Amongst the *desi*, the first cotton to be evolved was *16 Mollisoni* in 1929. This was replaced in 1930 by *15 Mollisoni*, which was, in 1934, replaced by *39 Mollisoni*. The latter is now the standard *desi* cotton of the Canal Colonies and the area under it during 1939-40 was estimated to be 435,000 acres. *39 Mollisoni* is said to have gained so much popularity that the demand for its seed exceeds the supply. It is stated to give much better yield than the cottons originally grown in the Canal Colonies; estimating the increased yield at even half a *maund* of *kapas* per acre, at Rs. 6 per *maund* (or Rs. 3 per acre), the additional income to the cultivators would amount to Rs. 13,05,000. *119 Sanguineum* is another *desi* strain evolved under the scheme; the area under it during the past year was about 10,000, acres. A few other strains of both *desi* and American cottons have also been developed and are under trial at present.

Several strains of *Jubilee* cotton were tested during the year and some of them appeared to be good in respect of lint length and ginning outturn; special mention may be made of *D.C. 17* which combines these characters with good yield. All the desirable characters have now been brought together in *Jubilee* cotton which is said to compare very favourably with the standard *Mollisoni*.

From the 83 American and 74 *desi* single plant progenies grown at Lyallpur, a total of 5,146 plants was selected in the field and the elite amongst these have been retained for propagation in 1940-41. 13 F9 progenies from the cross, *Mollisoni* × *Million Dollar*, were grown and further selections made. The cross, *C.B.S.* (*Barberton*) × *289F/43* has shown great possibilities in respect of lint length and ginning outturn which is about 34%.

Three families with average ginning percentage of 33.8 to 37.9% and halo length of 28.5 to 29.1 mms. have been bulked for preliminary trials. All the new *desi* and American strains were included in the preliminary varietal trials conducted at Risalewala and Multan sub-stations.

(b) **Scheme for improvement of Punjab-American 289F/K25 Cotton.**—This scheme was sanctioned in January 1938 for a period of five years and commenced work from the 9th July, 1938. The object of the scheme is the improvement of *289F/K. 25* cotton which was evolved at the B.C.G.A. Farm some years ago. Though this strain is said to be very popular in the Lower Bari Doab Canal Colony and the area under it has expanded very rapidly, it suffers from the defect of susceptibility to jassid attack. One of the aims of the present scheme, therefore, is to develop jassid-resistant strains from this cotton.

During the year under review, the crop in general suffered from *Tirak*; the B.C.G.A. Farm, where this scheme is being carried out, is reported to have been particularly affected, the average yield amounting to only 3.65 *maunds* per acre against 7·25 *maunds* in 1938-39. The experimental plots also suffered badly; some of the breeding material has been lost while there is a shortage of viable seed in the rest. The varietal tests also did not give any reliable figures. The area under *289F/K. 25* was estimated to be in the neighbourhood of two lakhs of acres. Although the average ginning percentage of this variety is good, the limits of variation are still very wide. F_1 progenies of the following two crosses were grown in 1938:—

(*a*) 289F/K. 25. × 289F/43 and reciprocal.

(*b*) 289F/K. 25 × 47F and reciprocal.

From the 15 F_2 and the first back-cross families grown during the year, seed of hairy, high ginning plants have been selected for sowing in the ensuing year.

(c) **Physiological Scheme.**—Partial failures of the American cotton crop in the Punjab occurred in the years 1919 to 1921, 1926 to 1928, 1931 and 1932. The external symptoms of the cotton plants during these failures were early reddening and shedding of the leaves, premature opening of the bolls with immature seeds and low quality lint and, in extreme cases, the dwarfing of the plants. To account for these failures, various views were advanced, such as, the heat stroke theory (Milne, 1924), attack of White Fly (Roberts, 1929) and unfavourable combination of climatic and biotic factors (Trought, 1931). As, however, these theories could not be supported by sufficient data, it was thought that these failures were due to malnutrition of the plant and a

physiological scheme was accordingly started, in March 1935, to study the physiology of the cotton plant with a view to determining, if possible, the nature of the nutritional disorder, the causes underlying it and the measures necessary to combat it. The scheme started work in 1935. In March 1937, it was decided to request the Empire Cotton Growing Corporation to loan the services of Dr. Mason to inspect the scheme and give his views on it. In January 1938, it was decided that a soil survey on a large scale should be carried out to connect up soil conditions with cotton failure as recommended by Dr. Mason. The scheme was due to terminate on the 14th March, 1940, but, at its meeting held in August 1939, the Committee sanctioned an extension for a further period of about three years.

The work done so far has indicated that two sets of soil conditions are associated with the development of *Tirak*, (1) soils with saline sub-soils and (2) soils with nitrogen deficiency. These conditions may exist either separately in separate fields or together, the intensity varying from field to field. Plants growing on soils of the first type are normal till July, but later exhibit symptoms of drought. The recovery from wilting after each irrigation is of short duration. By the beginning of September, the leaves begin to shed ; there is also considerable shedding of flowers. The bolls are few ; they crack and are found to contain immature seeds. In soils of the second type, the growth of the plant is luxuriant when the soil is light sandy loam. Starvation symptoms appear at the bolling stage when the leaves turn yellow and red and are shed. The size of the new leaves is comparatively reduced. The number of bolls produced per plant is normal but they crack and contain immature seeds. In very heavy soils, containing alkali salts in the subsoil, the growth, though normal for a few weeks, is later suppressed. The plants remain stunted and possess dark green leaves which show symptoms of drought. Premature defoliation of leaves and later *Tirak* occur. *Tirak* is found to appear in its most serious form on sandy soils with alkali salts in the subsoil ; such soils are also deficient in nitrogen. The bolls are small in size and open badly. Tannins are produced in leaves with low nitrogen content. Their presence in the leaves, which can now be easily detected by a simple method specially devised and known as the ' tannin test,' can safely be regarded as an index of nitrogen starvation. If nitrogen in the form of sulphate of ammonia is applied to a crop when the test for tannins is given by the leaves, it is found to recover within eight days after application and the appearance of *Tirak* can be prevented. *Tirak* on the first type of soil with the alkali salts cannot be ameliorated by the application of manures, which only results in vigorous growth.

Investigations of soil conditions where *Tirak* had appeared in the cotton crops in the years 1938-39 and 1939-40, in different cotton growing districts of the Punjab, have revealed that the same soil types found at Lyallpur are associated with *Tirak*, *viz.*, (1) soils with saline subsoils and (2) soils with deficiency of nitrogen.

The 'tannin tests' were carried out during the year on the *zamindar's* fields in the month of August and sulphate of ammonia was immediately applied at the rate of two *maunds* per acre to those fields where the test was positive. Equal numbers of control plots were also kept in each field. The results of the experiments carried out in the 1939-40 season showed great increase in yields and improvement in opening, as compared with the yields and opening in the control plots. It was also found economically profitable to apply the fertilizer to such fields. Similar 'tannin tests' on a still larger scale have been carried out in the current cotton season of 1940-41, and, though, final results of yields are not yet available in most cases, the treated plots have already yielded more than the control plots.

Late sowing of cotton is found to be a good ameliorative measure for *Tirak* on the second type of soil where there is salinity in the subsoil. Crops sown in the second or the third week of June are found to suffer much less from *Tirak* than crops sown in May which is at present the normal sowing time. The following observations have been made on the cotton crops sown early (May) and late (June) on such soils :—

(1) If the soil is highly saline within two feet of the soil surface,the late sown or the early sown crops are equally affected; the growth of plants is stunted and *Tirak* appears in both cases.

(2) If the soil is highly saline from the third or the fourth foot downwards, late sown crops suffer much less damage than the early sown under all conditions of weather.

(3) If the soil has medium to low salinity in the subsoil, the early sown plants suffer from *Tirak* if the weather conditions are unfavourable in September-October, while the late sown plants under similar conditions of soil and weather are found to suffer much less damage from *Tirak*.

(4) *Tirak* does not occur on normal (non-saline) lands under all conditions of weather if normal irrigations are given.

Amongst all the different varieties of cottons grown in the Punjab, the *desi* cotton (*Mollisoni*) is found to be most resistant to salinity, though it

cannot be considered as immune. All varieties of Punjab-American cottons suffer from *Tirak* on soils with saline subsoils. As salinity in the subsoil is a common feature of the cotton soils in the Punjab where these cottons are grown, all these varieties suffer from *Tirak* and they show more *Tirak* in a year of unfavourable weather conditions during the fruiting stage.

(d) **Root Rot Scheme.**—This scheme, which was sanctioned in 1932, is concerned with the investigation of root rot in the Punjab, where, particularly in the canal-irrigated areas, the annual damage done to cotton by this disease is estimated at several lakhs of rupees. Both *desi* and American varieties are equally affected by the disease which makes its appearance towards the end of June and continues up to the middle of September. The organisms responsible for the disease are *R. bataticola* and *R. solani*.

During the year under review, experiments were conducted in different places with American and *desi* varieties to ascertain the effect of sowing date on the incidence of the disease and it was observed that the disease was markedly reduced in cotton sown after the middle of June and also in cottons sown in the first week of April. These data support the findings of the previous year. It was observed that there was a reduction in mortality in cotton when it is inter-cropped with such crops as *bajri* and the lesser millets. Susceptibility of various varieties—37 Indian and 65 foreign—to root rot was ascertained by growing them on well-infected soil. Only nine foreign varieties which showed a narrow range of mortality, *i.e.*, 26 to 42 per cent., were selected for further trials. A number of fresh varieties were imported from various cotton growing countries for testing in the ensuing cotton season. One hundred and seventeen fresh selections have been made from the diseased plots, for test next season. No definite indications, regarding resistance of any type or selection to the disease, have so far been obtained.

(e) **Cotton Jassid Investigations in the Punjab.**—This scheme was sanctioned in March 1937. The object of the scheme is the study of the jassid insect in the Punjab, as regards its habits, alternative host plants and characters of the cotton plant which determine resistance to the pest.

Observations made during the year on the incidence of the pest on the commercial varieties have once again revealed that *289F/K. 25* is highly susceptible to jassid attack. Of the agronomic factors, only the effect of late and early sowings on jassid attack was tested and it was found that late sown cotton was definitely more susceptible to the attack. The progeny *Tanguis* × *U4*, which was found to be resistant to the pest in 1937, steadily lost its capacity for resistance and in 1939 actually succumbed to it. *Cambodia* cotton

is reported to have continued to flourish well under conditions of high infestation; its behaviour in future years will be watched. During the year, it was found that several species of jassids, other than *E. devastans, Distant,* were common in certain parts of the Province. These have been identified as *E. Punjabensis, E. Binotata, E. Kerri* and *E. Minor.*

Observations made on the number of eggs laid and their hatching on different varieties of cotton and *bhendi* showed that though the lowest number was laid on *39 Mollisoni* and the highest on *bhendi*, the hatching percentage was practically the same in all cases. The results obtained during the last two years have shown that the young nymphs have no difficulty in feeding and developing into adults even on the most resistant cotton, but, in the year under review, a very high percentage of nymphs developed into adults on American cottons and *bhendi* and not on *desi* cottons. This is contrary to previous findings. It was observed that the quality of lint has considerably deteriorated as a result of jassid attack in the more susceptible types, like *38F*, but not in the resistant types, like *289F/43*.

The pest infested other plants like *bhendi* (*Hibiscus esculentus*), Potato (*Solanum tuberosum*), Brinjal (*Solanum melongina*), and Hollyhock (*Althea Rosea*) besides cotton. Early in the season, the proportion of *E. devastans* appeared to be very low on all the host plants, but as the season advanced, this percentage increased appreciably.

(f) **The Punjab Clean-up Scheme.**—This scheme was sanctioned in March 1937 and is the outcome of the Punjab Entomological Scheme which successfully terminated in March 1937. Its object is to deprive the Spotted Bollworm of its food during January-April in a compact area immediately after the last picking is over and to study the effect of this measure on the yield of *kapas.*

As in the previous year, a compact area of 500 square miles, comprising 183 villages in Lyallpur and Jhang Districts, was selected for the removal of cotton stalks with *kudali* (a modification of Lantana *kudali* from Mysore). All other host plants were also carefully eradicated from this area.

The effect of the 'clean-up' measure on the Spotted Bollworm activity, during 1937-38 and 1938-39, on the succeeding cotton crops, both in the treated and the untreated areas, was studied and the results obtained are summarised below :—

(*i*) Cotton seedlings of both *desi* and American cottons in the cleaned area were practically free from the pest during the two years the campaign was in progress, the worm population on them varying

from nil to 2 per thousand seedlings. In the untreated area, on the other hand, infestation was considerable (particularly on the seedlings of *desi* cotton), the worm population varying from 11 to 20 and 1 to 4 per thousand seedlings of *desi* and American cottons respectively.

(*ii*) The Spotted Bollworm population in buds, flowers and bolls of *desi* and American cottons in the untreated area was more in 1938 and 1939 than in the cleaned area.

(*iii*) The number of open bolls damaged by Spotted Bollworms in the untreated area was about 4 times higher in 1938 and 5 times higher in 1939 than in the cleaned area.

(*iv*) The number of open bolls picked from plants grown free from Spotted Bollworm by night-caging, both in the treated and untreated areas, during 1938-39, was almost equal, but there were 6 bolls per plant more on the control plants in the case of the former area than on the control plants in the latter area.

(*v*) The increased yield of *desi* kapas per acre in the cleaned area was 20% per acre, while in the case of American cottons in the cleaned area it was 21.5% per acre.

(*vi*) The quantity of damaged loculi ("*Kani Phuti*") in the uncleaned area was double that in the cleaned area, both during 1938 and 1939.

(*iv*) CENTRAL PROVINCES AND BERAR.

(a) Scheme for Investigation of Heliothis obsoleta as a pest of cotton in the Central Provinces and Berar.—This scheme was sanctioned by the Committee in January 1938 for a period of one year and came into operation on the 25th June, 1939. The objects of the schemes were (1)to ascertain (*a*) whether *Heliothis obsoleta* attacking cotton in the Central Provinces and Berar is the common gram caterpillar which attacks gram and various other crops or a special biological race of the species which attacks cotton in particular and (*b*) whether it is identical with *Heliothis obsoleta* which is the American bollworm of cotton; (2) to determine its economic status and whether it is likely to prove a serious pest of cotton in the Central Provinces and Berar. The results obtained under the scheme are summarised below.

Observations made at Akola show that *Heliothis obsoleta* makes its appearance on cotton in July and continues to remain on this crop till November.

It prefers the exotic variety *Buri* to other varieties such as *Verum* and *Jari*. During 1939-40 season, it caused slight damage to *Buri*, but in 1940-41, its incidence was observed to be extremely low and stray caterpillars could be found with difficulty. At other places also such as Basim, Borgaon and Ellichpur, the incidence of the pest was low. As regards its seasonal history, the caterpillars are found on *tur* from November and persist till January. In December, however, they concentrate on gram which becomes heavily infested and suffers substantial damage. The caterpillars are also found on other crops such as groundnut, pea, tobacco, tomato, cabbage, and safflower. From March till June, though regular search was made on available alternative food plants on the Akola farm, not a single larva was found. One or two larvae on some vegetable crops were found in July-August.

The moths bred from various food plants were sent to the Imperial Agricultural Research Institute, New Delhi, for examination; as a result of which two points are definitely established, (*i*) that *Heliothis obsoleta* found on cotton is identical with that found on gram and various other food plants in India and (*ii*) that it is also identical with *Heliothis obsoleta* which is the American bollworm of cotton.

As regards the economic status of the pest, since the general incidence of the bollworms was extremely low, the conclusion based on observations of 1939-40 that *Heliothis obsoleta* is not a serious pest of cotton is more or less of a tentative nature. It can, however, be safely stated that, at the present stage, it does not threaten to be a serious pest of cotton.

(b) **Central Provinces and Berar Cotton Breeding Scheme.**—The Central Provinces and Berar Cotton Breeding Scheme was sanctioned by the Committee for a period of five years with effect from the 1st April, 1939, and replaced the Central Provinces Botanical Scheme which terminated on the 31st March, 1939. The object of this scheme is to evolve, by selection or hybridisation, suitable new strains of cotton which can compete successfully with the local *Oomras* in point of ginning outturn and yield and which, at the same time, possess a staple capable of spinning between 20s to 25s highest standard warp counts. The scheme is worked at Nagpur and at Akola, to suit the special requirements of the Central Provinces and Berar respectively. The work done during the year is described below under 'Central Provinces Cotton Breeding Scheme' and 'Berar Cotton Breeeding Scheme.'

The Central Provinces Cotton Breeding Scheme is concerned with the breeding of improved strains of cotton suitable for Nagpur, Wardha, Chanda and parts of Chindwara districts and capable of replacing the ordinary short

staple mixed cotton of these areas. The yield trials conducted during the year under review on the Government Farm and on cultivators' fields are reported to have brought out once more the superiority of *V. 434* over all other types of cotton grown. The yield obtained from it was 961 lbs. per acre and it has now established itself as being the best cotton for the tract.

432 selections from *Verum, Malvensis, Bani, Bishnoor, Bani* × *Cernuum* and *Buri* × *Lone Star* were tested for purity, and several strains of *Verum, Malvensis* and *Local Jari*, combining high ginning quality (32 to 36%) with good yield, have been selected for trial in the ensuing season. Twenty of the most promising strains from the cross *Bani* × *Lone Star*, possessing a staple length of 1″ to 1⅛″ with a ginning percentage of 30 to 37, have been selected for further study. The new strains, *H. 413, H. 414* and *H. 420*, obtained from the cross *Bani* × *Cernuum*, are reported to be promising.

The Cotton Breeding Scheme at Akola is concerned with the production of high yielding superior strains of cotton suitable for the Berars and possessing a staple of at least ¾″, with the softness, colour and strength of *V. 434* and a ginning percentage of above 33. Breeding of high ginning new strains of *buri* cotton for the Burhanpur *tahsil* also forms part of this scheme. Out of 260 single lines, grown from seeds obtained from Nagpur and the Akola farm, 82 were from *Buri* selections and 178 from *deshi* cottons. 8,299 plants were under observation and study; systematic notes were taken and records kept of their behaviour in the field from the time of germination to the time of picking. In the field, notes were taken on germination, vigour, resistance, or susceptibility to diseases, late or early maturity, character of bearing, shedding tendency, colour of flower, number of vegetative branches, bursting of boll, etc. Each selected plant was picked separately after examining the staple, feel, strength, etc. Out of 8,299 single plants, 2,718 were selected in the field and examined in the laboratory; no less than 80 per cent of the plants gave an yield which was above normal and about 75% had a staple length above ¾″. In ginning percentage, however, they fell off badly, giving only 9.25 per cent desirable plants. In addition to the number of plants selected from these, about 1,200 primary single-plant selections were made, mostly from ryots' fields. Some selections were also made in *V. 434, H* strains and *Buri*. Laboratory examination of individual plant-produce has indicated that this new material offers good chance for the isolation of more promising plants which will conform to the desired standard. Out of this collection, 539 plants have been finally selected for propagation and study during the ensuing season. There will thus be 968 single-line cultures for study next year.

Eleven *deshi* and 15 *Buri* types were grown in progeny rows. These had a total plant population of 396. Records were kept of each plant for different useful characters and they were later examined in the laboratory for commercial characters. *Deshi* cottons did not give satisfactory results, as their ginning percentage was found to be very low, ranging from 23.59 to 28.83 and, therefore, far short of the desired value which must be above 33.

Six yield test trials in randomised blocks were carried out during the year; 5 for the study of yield of the four most promising *H.* strains against *V. 434* and local *Jari* and one for comparison of yield amongst the different strains of *Buri*. These trials were conducted at Akola, Yeotmal, Ellichpur, Basim and Buldana, one at each place. The results were statistically analysed and it was found that local *Jari*, in four cases out of five, gave the highest yield, while *V. 434* occupied the second place in one, third place in three and fourth place in one. *H. 420* and *H. 415* also showed good results and appear to be fairly promising. Two field trials, on an acre scale, were also conducted in order to test the cropping power of the *H* strains against *V. 434* under different conditions of soil, one in the scheme area and the other in a cultivators' field in one acre blocks. *H. 420* gave the highest yield. On analysing the results of all these trials, however, it was found that except on the Buldana farm, where the results of some plots were affected by unfavourable situation, the differences were not significant. The higher ginning percentage of *H.* strains, however, is a factor in their favour compared with *V. 434*.

The period of development and the amount of shedding of flowers, buds and bolls were studied from the time of appearance of the first bud to the complete picking of *kapas* on ten plants each of *V. 434*, Late *Verum*, *Bani 306* and *Buri 107* cottons. *Bani 306* showed greater prolificacy than others; there was no appreciable difference in this respect between *V. 434* and *Late Verum*. Bud to flower period was nearly the same in all the varieties, but that of bud to the bursting of the boll was definitely longer in the case of *Buri 107*.

A topping experiment was carried out with the object of studying the effect of topping on *V. 434*, *Late Verum*, *Bani 306* and *Buri 107* cottons at different stages of their growth. The results indicated that the yield differences in different treatments were statistically insignificant. The time of maturity, however, was delayed by topping plants when one month old but the outturn from first picking was definitely increased when topping was done at the age of two months.

A study of the Root system of the above mentioned four cotton strains was also carried out at different stages of their growth in order to find out differences, if any, and to correlate these with varietal differences. A comparison of the mounted specimens of these showed a stronger development of the laterals in *V. 434* than in others.

(*v*) MADRAS.

(a) **Pempheres Scheme.**—In parts of Madras where *Cambodia* cotton is grown over large areas, healthy plants wither away all of a sudden due to damage caused by the cotton stem weevil. In seasons when the incidence of the pest is severe, the loss by death of plants may be as great as 25%. With the object of finding out ways and means of controlling and reducing this loss, the Committee in 1925 sanctioned the Pempheres and Physiological Scheme, which, however, owing to the difficulty of securing a competent plant physiologist, had to remain in abeyance. In 1931, however, it was decided to send for training in England two officers selected from the Madras Agricultural Department with a view to their eventually occupying the posts of physiological botanist and biochemist under the scheme. In the meanwhile, preliminary investigations were started under the direction of the Cotton Specialist, Coimbatore.

The scheme, as originally sanctioned, consisted of two investigations, one for the control of cotton stem weevil (*Pempheres affinis*) and the other for the evolution of a strain in *Karunganni* cotton resistant to the harmful effects of February rains. The first problem was pursued in three directions, botanical, bio-chemical and entomological. On the botanical side, the aim was to evolve a strain which would not allow the insect time to complete its life cycle inside the stem ; on the bio-chemical side, the causes that made strains susceptible to the insect and the factors that helped the plants to resist its attack more efficiently were investigated ; on the entomological side, efforts were concentrated to survey the distribution of the insect and to explore the possibility of checking its spread by biological methods.

In July 1938, the working of the scheme was reviewed and, as it was felt that the possibilities of biological control were doubtful and that bio-chemical research was also not likely to lead to any successful results, it was decided that these two sections of the work should be closed down with effect from the 31st October, 1938, and 31st August, 1939, respectively. It was further decided that the physiological investigations should also be terminated from 1st November, 1938, as the experimental work in this connection had been brought to a stage when further investigation could be continued by the Agricultural

Department itself. The botanical research was, however, extended upto October 1941 and it is with this that the work done during the past year was concerned.

During the year under review, the severity of weevil attack was unusually high at Coimbatore; *Co. 2* recorded 58% mortality against 28% in the previous year. As the plant reaction to insect infestation at Coimbatore and Srivilliputhur varied owing to the climatic differences, the criteria used in the selection of cultures at the two places differed. In the comparative trials at Srivilliputhur, only three sibs of *4413* (*Bourbon* × *Co. 2* cross) gave significantly higher yields than the control. *7176/6*—a resistant *Moco* culture—yielded as much as the control. In a similar trial at Coimbatore, *7178/7* and *7176/5*C—derivatives of *Moco* × *Co. 2* cross—were on par with the control in respect of yield but far superior to it in the degree of resistance. The sibs of *4413* have proved to be distinctly more productive even at Coimbatore, but they did not show the desired degree of resistance. Out of 222 progeny rows at Srivilliputhur, only three recorded low mortality and adult emergence. At Coimbatore, where 716 cultures were under trial, 19 cultures, 17 of which were derivatives of *Moco* × *Co. 2* cross, proved to be resistant and high yielding. *6142* was found to combine all the desirable characters, except boll size. Periodical examination of the resistant strain—*7178/7*—and the susceptible type—*Co. 2*—was carried out and the former strain with its capacity to gum the infestations from the early stages, was found to be distinctly more efficient in resisting the weevil attack than the susceptible type *Co. 2*.

(b) Scheme for improvement of Mungari cotton in Madras Province.—This scheme was sanctioned by the Committee in 1937 and has for its object the evolution of strains suitable to the red soils and combining the quality of the *Westerns* with the yield of *Mungari*, to replace the inferior *Mungari*, the existence of which affords opportunities for mixing, with the result that the better cottons of the tract fail to get their proper value. On the black soils of Anantapur, Bellary and Kurnool districts of the Madras Presidency, cottons commercially known as *Westerns* and *Northerns* are grown. These are medium staple varieties, capable of spinning 24s to 32s. The type of cotton grown on the red and mixed soils, on the other hand, is that known by the name of *Mungari*, which is a coarse short staple variety, similar to Bengals, and not fit to spin more than 8s or 10s. The co-existence of these widely different varieties in the same tract favours undesirable mixing with the result that the better cottons suffer in value. It is to overcome this difficulty that the *Mungari* scheme was started.

During the year under report, *V. 434* and x *4383* were again found to be satisfactory and, but for its low ginning and susceptibility to 'stenosis,' *V. 434* would have been considered a good substitute for the local *Mungari*. The strain, x *4383*, though free from these defects, is highly susceptible to thrips. Further trials are necessary before a final choice for the tract can be made. Of the 345 cultures under progeny row trials, 252 were picked and compared with the local; of these, 6 were found to be superior and 52 equal to the control in respect of yield. The handling of the breeding material was reported to have been handicapped by the heavy damage caused by the groundnut red hairy caterpillar and the occurrence, on a large scale, of the small leaf disease—'stenosis'—in all the country cottons.

(c) **Madras Nadam Cotton Breeding Scheme.**—This scheme was sanctioned in 1933 with the object of securing one or two suitable annual types of cottons capable of replacing *Nadam* (*G. arboreum* var *typicum* forma *indica*), a perennial variety, in the red soil areas of Salem and Coimbatore districts where, due to poor soil and precarious rainfall, neither *Karunganni* (*G. arboreum* var *neglectum*) nor *Uppam* (*G. herbaceum* var *frutescens*) can be satisfactorily grown. *Nadam*, being a perennial variety, serves as a breeding ground for pests like the stem weevil and pink bollworm during the close period of *Cambodia* prescribed under the Madras Pest Act. The object is sought to be achieved either by crossing *Nadam* with annual types or by the introduction of suitable early growing varieties.

Though the rainfall of 33.01" during the year was far in excess of the average, its unfavourable distribution proved harmful to cotton. 432 cultures (294 of American and 138 of Asiatic types) were tested in replicated progeny rows using *Co. 2* and *K1* as control. Only 7 cultures of American crosses were found to be superior to *Co. 2* in respect of yield. In the case of the Asiatic types, none was better than *K1*. Another yield test revealed that, while in the American series none of the strains was better than *K1*, in the Asiatic Series, strain *6145* gave significantly better yield than the control. In the perennial cotton series, *K1* was found to be the best.

Attempts made to isolate early maturing and productive types in *Nadam* variety by simple selection have not proved successful and the introduced and hybridised material does not contain the desired combinations of characters. It is, therefore, proposed to terminate the scheme in 1941.

(d) **Scheme for Improvement of Cocanadas Cotton in Madras Province.**—This scheme was sanctioned by the Committee in November 1938 for a period of five years and commenced work from the 1st February, 1940. The object

of the scheme is to improve the yield and ginning percentage of *Cocanadas* cotton, preserving, at the same time, the light pinkish colour of its lint, owing to which, it is in great demand for the manufacture of dyed yarns.

During the period under review, the cotton areas of Nellore, Guntur and Krishna Districts were surveyed and samples of 642 single plants and 53 bulk lots were collected. The survey has revealed that on shallow red and light black soils the crop is sown early, while, on the deep black soils, late sowing is the rule. Arrangements have been made to sow the collected material on both types of soils.

(e) **Scheme for investigating the possibilities of control of Cotton Stem Weevil of South India.**—This scheme was sanctioned in November 1938, for a period of one year, for investigating the possibilities of control of the cotton stem weevil of South India by means of its natural enemies.

During the year under report, the presence of the cotton stem weevil was noted in all cottons grown in the Salem district and in several alternate host plants in North Arcot and the Malabar districts. The infestation, which commenced in October, gradually increased and reached its height late in February or early March. Thereafter, there was a decline. 5,279 alternate host plants, composed of 14 species belonging to 7 genera, have been examined for infestation. Two of the species have been classed as doubtful hosts and two as new hosts. The study of the biology and distribution of the parasites was continued and two new parasites were observed during the year. It was found that the highest percentage of parasitism in cotton was only 0.83 compared with 13.9%, 2.08% and 2.6% noted in *Triumphetta rhomboidea*, *Hibiscus vitifolius*, and *Pavonia Zeylanica*, respectively.

(*vi*) UNITED PROVINCES.

The United Provinces Botanical Scheme.—This scheme was sanctioned by the Committee in January 1938 for a period of five years and was put into operation in August 1938. It is concerned with the development of improved strains of Bengals cottons for the rain-fed and irrigated tracts of the United Provinces from the material collected in the course of the recent survey of cottons conducted in Rohilkhand and Bundelkhand and the investigation of the possibilities of growing long staple cottons in the Pink Bollworm controlled areas. Concurrently, the suitability of the United Provinces improved cottons—*C. 402*, *C. 520* and *Perso-American*—against local and other promising introductions is being tested, both on Government farms and on cultivators' fields.

The crop, during the year under review, suffered for want of rain in August and from heavy rain and strong winds in September in a number of districts. Detailed examination, purification and replicated tests of the material derived from the original 27,000 single plant collections were carried out at each of the four research stations located in the four cotton growing tracts of the Province. The promising selections from the 1933-34 and 1935 material were tested against the existing improved types, *C. 520* and *C. 402*. The progenies of 17 selections from the 1937 material, did not give significantly higher yields than *C. 520*; a few strains were, however, selected for testing in the ensuing year. From the crop of 1938, only 26 selections that satisfied the standards of yield, staple, etc., have been carried forward for study in replicated progeny row trials. The trials of *C. 402* and *C. 520* have indicated the possibility of getting some better material than the existing bulks. In the trials of fresh introductions of *desi* types, *viz.*, *Mollisoni 116*, *M. 52* and *Sanguineum 119*, against *C. 520*, *M. 116* showed its superiority in respect of yield in two places, but the difference was not significant. Amongst the Americans, none fared better than the *Perso-American*.

The established strains were tested extensively, both on Government Farms and on cultivators' fields under irrigated and dry conditions. A study of the results on Government farms under dry conditions revealed the general superiority of survey types 'D', 'A' and *C. 520* over types 'L' and *C. 402*. Spacing experiments are reported to have shown that closer spacing tends to produce better yields, under irrigated conditions. In view of the encouraging performance of *Perso-American* during the last few years, it was tested on a large scale during the year under report. It was sown over an area of 140 acres in Ujhani (Badami) and is stated to have given an increased income of Rs. 1,800 to the farmers. *C. 520*, an improved *desi* strain, is reported to be gaining in popularity, owing to its general superiority over the local growths. The area under it rose from 29,000 acres to 34,449 acres in the past year.

(*vii*) BENGAL.

Comilla Cotton Scheme.—This scheme was sanctioned in February 1933 and came into operation in December 1934. It is concerned with the improvement of the commercial characters of *cernuum* cotton by the isolation of a coarse, high ginning and good yielding strain, suitable for mixing with wool.

During the year under report, 28 strains were under trial for yield and ginning percentage. There were also 490 single lines under observation,

some of which appeared to be very promising. 12 bulks were formed from the lines of replicated progeny rows of 1938-39 for seed multiplication. These were sown in the *jhum*. One of these proved to be a good yielder with a ginning percentage of 42.5. The coarseness of fibre was equal to that of Garow Hill cotton. Of the 22 bulks formed from the trials of survey, *Nos. 14* and *19* are worthy of mixture, both being good ginners, hardy and capable of giving good yield. Their lint, however, is slightly less rough.

(*viii*) BALUCHISTAN.

Scheme for control of Black-headed Cricket in Baluchistan.—This scheme was sanctioned in August 1939 for a period of two years to run concurrently and in co-ordination with the scheme for investigation into the Black-headed Cricket in Sind sanctioned by the Committee in January 1938. The object of the scheme is to find out measures which will be effective in controlling the pest in the early stages of the growth of the cotton plant when it is said to cause a great deal of damage. It is reported that the pest, which is of a nocturnal type with a migratory habit, can be controlled by means of barriers and baits placed in its way. As a result of the measures adopted, infestation was reduced to hardly 5% in the Usta *tehsil*. The control measures would have been more successful had they been undertaken early in April.

(*ix*) HYDERABAD.

(a) **Botanical Research Scheme**—Hyderabad is the third biggest cotton growing territory in India and some years back it had the reputation of producing one of the finest indigenous cottons, *viz.*, *Gaorani* or *Bani*. This long staple variety, however, suffered from the defect of being a low ginner with the result that it has now been largely replaced by high ginning short staple *neglectums*. In 1929, the Committee, realising the importance of this large cotton tract, sanctioned a botanical research scheme known as the Hyderabad Botanical Research Scheme, Parbhani, the object of which is to study the several varieties of cotton grown in Hyderabad and to secure from them, high ginning medium staple types, to replace the existing varieties in the different parts of the State. A large number of improved pure strains has been evolved under the scheme, amongst which *Gaorani 6* is the most outstanding.

During the period under review, preliminary tests on 624 new selections of medium and short staple *Gaorani* were carried out at Parbhani, Latur and Madhol. *Gaorani 4B-5* and the local variety of Parbhani were used as control.

50 progenies were selected, on the basis of yield and other characters, for inclusion in comparative tests next season. About 1500 plants picked from the cultivators' fields in the *Gaorani Protected Area* and from the plants grown at Parbhani and Latur were examined and 350 of these were reserved for further study.

The varietal tests conducted at Parbhani and Madhol with other four strains, *viz.*, *G. 4B-5*, *G. 6*, *G. 6E-3* and *G. 115*, using *Gaorani Umri* as control at both the places, showed that *G. 115* is definitely superior in respect of yield. In the trial at Latur where *G. 6* and *G. 115* were substituted by *G. 3B-1* and *G. 123* and where Latur *Gaorani* was used as the control, *G. 3B-1* gave the highest yield, but it had a slightly coarse fibre. In the second set of varietal trials at the Experimental Farm and the Research Station, Parbhani, 4 strains—*G. 16C*, *PB 703G-2*; *G. 12-F* and *PB 26D-4* were tested against *Gaorani Umri*. Judging from the yield figures and the economic characters, *G. 16C* is the most promising of the improved strains. Its lint was adjudged suitable for 27's highest standard warp counts. In the comparative test on 24 medium staple strains against *Gaorani Umri*, conducted at the Cotton Research Station, Parbhani, 22 strains were found to be better in respect of yield and fibre length than *Gaorani Umri* and 4 of these—*Gaorani 115*, *Gaorani 126*, *Gaorani 149* and *Gaorani 130*—excelled it by about 50%. Another comparative test with 14 *Gaorani* strains was conducted at the Plant Breeding Station, Latur, against the local *Gaorani*. In this, *16C* gave the highest yield and the differences between it and all the other strains were significant. *P. B. American 2* was the only strain that gave a significantly lower yield than the local variety. A similar test with 13 strains and *Gaorani Umri* was conducted at Madhol; in this all the strains gave significantly higher yields than *Gaorani Umri* and three of them, *viz.*, *Gaorani 58A-1*, *Gaorani 143* and *Gaorani 145*, excelled it by about 50%. All the improved strains possess longer fibre and higher ginning outturn than *Gaorani Umri*. The superiority of *Gaorani 16C* was confirmed in another experiment tried in the Parbhani district. In the study of resistance to wilt, 12 progenies recorded 0—3% mortality against 6% of *Gaorani 6*. A new strain, *Parbhani American*, which was tried for 3 years in the hill areas of Aurangabad district, gave satisfactory results; it spins 30s highest standard warp counts against 6s to 10s of the parent bulk.

During the year, 4,182,546 lbs. of *Gaorani 6* were distributed over an area of 2,32,300 acres. The total production of lint amounted to 40,000 bales, *i. e.*, an average yield of nearly 215 lbs. of *kapas* per acre. The entire produce was ginned, pressed and sold under State supervision and it was

estimated that the growers of *Gaorani 6* realised Rs. 6,00,000 more on account of the superior quality of the strain alone. Nearly 5,250,000 lbs. of pure seed were purchased by the Department of Agriculture for distribution in the current season in a compact block of about 3,30,000 acres. The natural spread is estimated to occupy about 40,000 acres.

(b) Pink and Spotted Bollworm Scheme.—This scheme was started in January 1933 with the object of determining (1) the actual amount of damage done by the Pink and Spotted Bollworms to the cotton crop in the Godavary Valley, (2) the progress of their attack on the growing crop in the season, (3) the mode of their carry-over from one season to another and (4) the effect of the likely control measures. The scheme closed down in May 1940.

The investigations on the Pink and Spotted Bollworms in the Hydreabad State have shown that the damage by the former is more in the early pickings, whilst the Spotted Bollworm does more damage in the later pickings. The bolls affected by the bollworms are commonly observed to open prematurely. Though a number of alternative host plants were found to harbour the Pink Bollworm, the possibility of carry-over through them is considered remote as all of them dried up before March. The summer-sown *bhendi*, however, permits the continuous breeding of the pest. The stand-over cotton plants and their sprouts also serve as suitable media for the breeding of the pest during the off-season. Examination of the soil during the off-season, March-June, showed the presence of the Pink Bollworm caterpillars upto a depth of 18 feet. The early ripening varieties, like *Gaorani 6*, escape bollworm damage to a great extent while the American types suffer the most.

The study of the different problems has revealed that the prevention of the carry-over of the pests from one season to the other is the only measure of control that can be adopted against the bollworms and the operations suggested for an effective prevention of the carry-over are :—

1. Growing of early maturing types,
2. Early harvesting of cotton,
3. Removal of all cottons and cultivated and wild alternative host plants,
4. Prevention of the cultivation of *bhendi* and *ambadi*,
5. Ginning of all *kapas* before the end of April, and
6. Controlling the import of seed or seed cotton known to be infested by Pink Bollworm.

(c) **Hyderabad Bollworm Clean-up Scheme.**—This scheme, which is the outcome of the investigation conducted on the bollworms of cotton during the years 1931-37, was sanctioned in August 1936, but, owing to administrative difficulties, it could not be put into operation before the 1st October, 1937. The object of the scheme is to demonstrate the efficacy and practical value of the following control measures against the Pink and Spotted bollworms in a compact area of about 400 square miles in Nanded district :—

1. Removal of cotton plants as soon after the final picking as possible,
2. Completion of ginning of all seed cotton before the 1st May of each year,
3. Removal of alternative host plants and prohibition of cultivation of *bhendi* and *ambadi* in the off-season.

The research carried out at Parbhani has shown that the Pink and Spotted Bollworms are together responsible for a loss of 25 to 33 per cent of the annual crop, the newly developed, early maturing strains of *Gaorani* suffering markedly less than the existing commercial variety. The Spotted Bollworm passes from one cotton crop to the next by continuing to breed either on cotton plants left standing in the fields after the final picking, or on alternate host plants of *bhendi* (*Hibiscus esculentus*) and *ambadi* (*Hibiscus cannabinus*) grown as garden crops during this period. The Pink Bollworm either remains active on the standing cotton plants till the first week of May or goes into hibernation from October onwards. It has been found also that unlike the case in the United Provinces, the Punjab and Egypt, very few larvae of Pink Bollworm hibernate in seed. Most of the hibernating larvae exist either amongst the fibres of *kapas* or in the cracks that are so characteristic of black cotton soils after the end of the rainy season.

The following items were studied during the year under report :—

(1) Incidence of bollworms on the new crop of cleaned and untreated, and early and late cleaned, areas.

(2) Analysis of the ripe crop of the same tracts for damage by bollworms.

(3) Complete clean-up of cotton fields in the Control Area.

(4) Prevention of growing of *bhendi* and *ambadi* in the off-season and

(5) Completion of the ginning of all *kapas* before 30th April, 1939.

Due to the low carry-over of Pink Bollworm from 1938-39 and the abnormally early maturation of the new crop, the attack of the pests on the 1939-40

crop was low, both in the treated and untreated areas. However, the differences between these areas in respect of the initial as well as subsequent attack (more specially of the Spotted Bollworm) were fairly clear. The effects of early and late cleaning of *Gaorani 6* on the incidence of bollworms on the new crop were masked by the effects of differences in the nature and fertility of the soil of the tracts so treated. The soil examination of early and late cleaned areas in 1939 had indicated a smaller aestivation of Pink Bollworm in the early cleaned plots. Similar examination of soil in 1940 failed to reveal any such difference. This is ascribed to the abnormally early maturation of the 1939-40 crop and the extremely dry weather from October 1939 onwards. The analysis of ripe crop of early and late cleaned areas also gave more or less similar results.

The clean-up work was carried out successfully for the third season. In much of the area, the clearance of fields was completed by 15th March, *i.e.*, six weeks earlier than in the previous year. An area of about fifty square miles, growing *Gaorani 6*, was cleaned much later in the season, in order to compare the effects of early and late cleaning on the incidence of bollworms on the succeeding crop. Financial and physical difficulties, coupled with the aversion of the annual tenants to clean their leased lands, were found to be the greatest hindrances in the early clean-up of cotton fields. The ginning of all the *kapas* in the treated area was completed before 30th of April and the growing of the alternative host plants, *bhendi* and *ambadi*, in the off-season was successfully prevented. However, none of the vegetables suggested as substitutes for *bhendi* and *ambadi* during the off-season was found to gain popularity with the cultivators.

(d) Scheme for inclusion of Northerns and Westerns Cottons in Programme of work of Dry Farming Scheme at Raichur.—This scheme, which was sanctioned in March 1937 and renewed in July 1938, has a two-fold object, *viz.*, (1) to consider the possibility of growing medium and long staple cotton in short staple areas in India, and (2) to find out how far the devising of dry farming methods would go hand in hand with the successful growing of such cottons in the dry and low rainfall tracts of the country.

The work during the year under review was carried out on the same lines as in the previous year with the necessary modifications suggested by the Committee. The following four experiments were under study :—

1. Manurial cum varietal experiment,
2. Tillage experiment,
3. Bunding experiment, and
4. Observations to test the superiority of varieties.

The first experiment was conducted with 3 varieties, *viz.*, *H. 1*, *N. 14*, and local; and three manurial treatments, *viz.*, compost, groundnut oil cake and no manure. The treatment effects and varietal differences were not found to be significant. Oil cake, however, increased the yield by 14.6%. The performance of *N. 14* was interesting in that its yield did not suffer, despite the reduced stand on account of root rot damage. *H. 1* yielded 4.6% less than the control. In experiment 2, three treatments—deep ploughing, tine-tooth cultivation only and blade harrowing only—were tried using the variety *Hagari* 1 in all the treatments. The final yields did not show differences as a result of the treatments. In experiment 3, bunding showed an increase of 15.9% in the final yields over no bunding, but the differences were not statistically significant. In experiment 4, local strains—*R. K. 19* and *R. K. 15*—ranked highest in respect of yield; *H.1* and *N. 14*, which topped the list during the past three years, gave considerably lower yields, due to severe damage by root rot in the early stages.

(e) **Scheme for improvement of Kumpta Cotton.**—This scheme was sanctioned in August 1936 for a period of five years and came into operation in November 1937. It has for its object the development of suitable strains of *Kumpta* cotton from the local variety of Raichur.

During the year under report, comparative trials were conducted with the most promising new strains, their parent variety and the imported types, like *Hagari*, *Nandyal 14* and others. Of the new strains tested at Raichur, *R. K. 15* gave a significantly higher yield and better ginning outturn than the other new strains and the imported types, though in spinning performance it showed a slight falling off. *R.K. 19* maintained its drought resistant and spinning qualities. The trial conducted at Kopbal brought out the superiority, in respect of yield, of *Jayawant* and the local variety over the three Raichur strains—*R.K. 15*, *R.K. 19* and *R.K. 27*. The failure of the latter strains is stated to be due to the heavier rainfall in the Kopbal area. Amongst the imported types from Mysore, Madras and Bombay, *K. 1* and Mysore *strain 19* gave satisfactory yields. *R.K. 15* was planted on about 40 acres for multiplication of its seed. In spite of the damage by *Fusarium* wilt, the yield obtained was far in excess of the local.

(*x*) BARODA.

(a) **Baroda Root Rot Scheme.**—This scheme which has for its object the study of the root rot disease of cotton in Baroda and the production of strains resistant to it was sanctioned in July 1931 and came into operation in February 1932.

During the year under review, *K.S.* progenies from the last year's material were tested for root rot resistance in a glass-house. Crops like *bajri*, rice, *sann* hemp, *variali*, *tur*, which are usually sown mixed with cotton were rotated with the latter and also sown in alternate rows with cotton to study their protective effect on the disease. The results indicated that intercropping with *sann* or *bajri* significantly reduced the mortality of the cotton crop. Twelve of the best *K.S.* families were selected and replicated five times but no significant differences in yields between the families were found. The best plants, showing higher resistance, good yield and other economic characters, have been selected for inclusion in the next year's trials. Sixty of the best *karkhadi* plants, including new selections, were grown in a progeny row trial and the differences between progenies were significant both in respect of mortality and yield. The high yielding capacity of *karkhadi* families, in comparison with *Broach 9*, was also brought out in the bulk trials. Spinning performance of the eleven families tested at the Technological Laboratory gave about 10's against 24's of *Broach 9* and it is proposed to effect an improvement in quality by hybridizing the most favourable *karkhadi* strains with quality cottons like *1027 A.L.F.*, *Verum*, *Jarila* and *Gaorani*. Further selection in *karkhadi* would be confined to plants with greater root rot resistance.

(b) **Plant Puller Propaganda Scheme.**—This scheme, which aims at the eradication of the Spotted Bollworm by the uprooting of cotton stalks by the use of the plant puller, was sanctioned in August 1934 and came into operation on the 1st January, 1936.

During the year under report, the number of plant pullers sold in the Baroda District and the Navsari District was 4,831 and 1,980, respectively, and the area handled amounted to 167,612 acres and 178,594 *bighas*, respectively. The percentage of the uprooted area was 72 in the Navsari District against 84.05 in the Baroda District.

(c) **Scheme for improvement of Mathio Cotton at Amreli.**—This scheme, which was sanctioned in August 1936 for five years and put into operation on the 1st June, 1937, has for its object the improvement of *Mathio* mixture in respect of yield, ginning percentage and quality and the trial at Amreli of the early strains of *Wagad* evolved at Viramgam with a view to replacing, if possible, inferior *Mathio* by early *herbaceums*.

During the year under review, the 10 *Mathio* selections, with 33%—37% ginning capacity and 0.72″ to 0.79″ staple, were grown in replicated rows. *Selections 9* and *10* maintained their high yielding capacity for the second year. *Nos. 5* and *6* were superior in ginning (36%) as well as spinning (21s—22s)

while *Nos. 2* and *3* were good in respect of lint length only. The bulk test with the above ten types and five other promising selections confirmed the high yielding capacity of *Nos. 9* and *10* and also showed that *No. 15* is even better than the other two in yield. Six varieties—*N.R.*, *C. 520*, *Jarila*, *Banilla*, *V. 434* and *V. 438*—were tested in replicated plots against the local *Mathio; N.R.* responded best with a yield of 472 lbs. per acre while *C. 520* and *Mathio* closely followed with 463 and 460 lbs., respectively. All these, however, were poor in respect of staple and spinning quality. *C. 520* and *Banilla* gave a ginning percentage of 34 and 35, respectively, the others being lower. *C. 520* is in addition an early maturing type. The consistent better performance of *C. 520* during the last three years prompted the undertaking of trials on a large scale on the cultivators' fields. The other varieties suffered from more than one defect and were found unsuitable to the tract.

(*xi*) BIKANER.

Bengals Cotton Improvement Scheme.—The opening of the Gang Canal under the Sutlej Valley Scheme resulted in the colonization of a new and virgin area, known as the Gang Canal area, with immigrant peasants, mostly from the Punjab, who were accustomed to the cultivation of the Punjab *desi* and American types of cotton. These cultivators found it difficult to successfully cultivate cotton under local conditions, evidently because the new environment was not quite the same as they were accustomed to in the Punjab. It was even feared that the area under cotton would be seriously reduced. This scheme, was therefore, started in January 1931, for the purpose of studying the local problems of the agriculturists and for obtaining by selection and hybridisation one or more superior types of cotton suitable to the locality. Until 1934, the botanical work was confined to the testing out of a large number of outside varieties both *desi* and American. After that year, however, extensive survey of the Rajputana tract was undertaken to collect breeding material; at the same time, extensive trials of the few selected cottons from outside were continued to test their suitability to the tract. Agronomic work was pursued intensively from the beginning of the scheme. At the end of the first five years, it was found that *C. 520* was the most profitable cotton to grow in the tract and the American cottons were generally unsuitable because of their low yield and susceptibility to disease. Also the staple of *Punjab-American* cottons was found to deteriorate both in length and strength when grown under Ganganagar conditions. A large amount of data and useful information regarding sowing times, seed rate, frequency and distribution of irrigation, optimum spacing for the *desi* and American cottons, rotation and manuring have been collected.

Since 1934, greater attention has been paid to selection and breeding problems ; the results obtained so far are summarised below :—

(1) Re-selection in *C. 520* has yielded strains which show much better germination possibly also a little higher yield than *C. 520.*

(2) Some of the local selections have proved better yielders than *C. 520*, but are poorer in quality.

(3) It appears doubtful whether mere selection would improve the quality of the *desi* cotton.

(4) Breeding tests have shown that there are possibilities of improving the quality by hybridization. As regards cottons that may be used as parents, the set *C. 520* × *Bani* appears to offer the best chances of achieving the desired results.

(5) For the last two years *P.A. 289F* has done as well as *C. 520* but it suffers from immaturity of the seed.

(6) In a variety *cum* agronomy experiment, interesting results have been obtained which show that the *desi* cotton (*C. 520*) can respond as well as the American to more favourable conditions—liberal watering and manuring, etc.

During the year under review, special attention has been paid to ensure, as far as possible, a good initial stand, by avoiding bad germination on account of defective seed. Selections from within *C. 520* did not prove to be better than the parent type. One selection from the Rohilkhand survey material, *viz.*, *R. 18*, was distinctly better than *C. 520* in yield and ginning percentage. Testing of the material of the cross—*C. 520* × *bani*—had to be abandoned, owing to very poor germination and high incidence of *Tirak.* The varietal experiments, in which 3 American and 5 *desi* cottons were compared with *C. 520*, showed that the final stand expressed as percentage of stand at thinning varied between *47-57* in American and between *41-73* in *desis. Sanguineum 119* gave the highest stand, while *R. 18* gave the lowest. *R. 18*, however, with its productivity, high ginning and a staple equal to that of *C. 520* is expected to bring greater monetary return to the cultivator than *C. 520.*

The result of manurial experiments for the last three years have shown that manuring has not only no effect on yield, but it tends to decrease the stand by encouraging white ant attack. Heavy irrigation, however, conserves the stand and increases the yields. There is no evidence that the American varieties differ from the *desi* types in their response to either of the treatments-manuring and irrigation.

(*xii*) MYSORE.

Mysore (Doddahathi) Cotton Scheme.—This scheme was sanctioned in February 1935 and came into operation in November 1935. It is concerned with the breeding, from the local *Doddahathi* or American cotton, of suitable types, resistant to "red leaf" disease which stands in the way of the expansion of this crop in the Irwin Canal area in Mysore State.

Of the 12 selections tested during the year in replicated randomised layouts, all except x *4383*, *M.A. II*, x *3915* and *Co. 1267* gave poor yields; their germination, vigour, boll shedding, flower and boll production indicated that the Indian *hirsutums* particularly *M.A. II*, x *4383*, x *3915* and *Co. 1267* are more vigorous than the African *hirsutums* or *barbadense*. Plantings done during February-July produced a higher number of bolls than those done during August-December. The highest yield was recorded from March planting. The four varieties referred to above proved to be the best in respect of yield of seed cotton per acre in all the sowings. The incidence of the 'red leaf' disease varied according to season but these four varieties were the least affected; the African *hirsutums*, *Punjab American* cotton and *Gadag No. 1* suffered the most.

The manurial trials indicated that higher doses of nitrogen given at different periods of plant growth produce a greater number of healthy plants.

Selections were made in *M.A. II*, *Co. 2*, *289F/38*, *289F/1* and local *Doddahathi* from the standpoint of resistance to 'red leaf,' vigour, lint length and lint percentage. Selections of *M.A. II* showed a greater degree of resistance to disease than *Co. 2*. The F_1 generation of the crosses between *G. peruvianum* and *M.A. II* and *Co. 2* were found to be more resistant to the disease than *M.A. II* or *Co. 2*. It is reported that seed of *M.A. II* was distributed to replace local *Doddahathi* in several districts of Mysore and that seed of x *4383* and x *3915* was distributed for trial under *barani* conditions.

CHAPTER III.

SEED DISTRIBUTION AND EXTENSION SCHEMES.

At first, the grants made by the Committee were restricted to agricultural research, but in 1929 it was decided that the time had come to add support to the efforts already being made to bridge the gap between the experiment station and the cultivator, and to supplement the funds which the Agricultural Departments were devoting to the introduction of improvements into agricultural practice. Special attention has since been devoted to seed distribution schemes, and to the more extended distribution of pure seed of improved varieties of cotton. During the period under review, there were sixteen seed distribution and extension schemes in operation in the various cotton growing provinces and States; a brief report on the working of these schemes is given below :—

1. BOMBAY.

(a) Surat Seed Distribution Scheme.—This scheme was first sanctioned in November 1929 for a period of two years. In December 1931, it was extended for another two years, pending the final decision of the Committee on the cotton policy to be adopted in the Surat area. In January 1934, after a thorough examination of the relative merits of *1A* and *1027 A.L.F.*, the Committee finally decided in favour of the latter and extended the scheme for five years for the distribution of *1027 A.L.F.* seed in the Surat area. In November 1938, the scheme was extended for a further period of one year and again, in August 1939, for three years, from the 1st April 1940.

During the year under report, the Department of Agriculture controlled a seed multiplication area of 17,874 acres (including 1,687 acres grown with farm pedigree seed) against 11,756 acres (including 864 acres with farm pedigree seed) in the previous year and distributed 22,73,633 lbs. of seed (including 6,78,572 lbs. supplied to Indian States) against 19,63,486 lbs. (including 9,42,862 lbs. supplied to Indian States) in the previous year. Owing to the amendment of the Bombay Rules under the Cotton Transport Act, 1923, restricting the importation of inferior types of cotton, there was a good demand for *1027 A.L.F.* seed. It has been reported also that, as a result, all co-operative societies in Olpad and several other growers changed their policy and favoured the growing of *1027 A.L.F.* In the absence of provision in the amended Cotton Control Act, prohibiting the growth of other inferior cottons in the tract, some cultivators are reported to have openly grown *Surat 1A*.

This would indicate the need for the application of the amended Cotton Control Act to the whole area lying south of Nerbudda as early as possible.

A supplementary scheme, which was sanctioned in November 1938 with the object of controlling the spread of selection *1A*, came into operation on the 1st February, 1940. It is expected that as a result of the survey of the area south of the Tapti and with the opening of check stations, the infiltration of this selection as well as other inferior cottons into the Surat tract and other adjoining protected areas where *1027 A.L.F.* is grown will be prevented.

(b) Khandesh (Jarila) Seed Distribution and Extension Scheme.—This scheme was sanctioned in March 1937 for a period of ten months in the first instance, pending settlement of the policy regarding the apportionment of the cost of schemes between the Committee and Provincial Governments and States. On the settlement of this question, the scheme was extended, in January 1938 for a period of one year, and in November 1938, further extension of three years was granted. The object of the scheme is to replace *Banilla* in the Khandesh tract with *Jarila*, which is wilt resistant, over an area of about 1,55,000 acres.

During the year under report, 6,84,536 lbs. of *Jarila* seed were sown over an area of 30,079 acres, against 97,990 lbs. over 4,836 acres last year. The natural spread of this variety is estimated at 40,000 acres. 5,36,442 lbs. of pure seed were purchased and stocked for distribution during the next season. *Jarila* is reported to have given an average yield of 345¼ lbs. per acre against 309 7/12 lbs. of the local variety. About 6,680 bales of cotton, ginned under departmental supervision, were sold by auction at a premium of Rs. 13 to Rs. 34 '*ON*' Broach, against Rs. 38 to Rs. 48 '*ON*' Broach, obtained in the previous year.

(c) Deccan Canals (Banilla) Seed Distribution Scheme.—This scheme was sanctioned in January 1934 for a period of five years and came into operation in April 1934. In August 1939, a further extension for five years was sanctioned. The object of the scheme is to supply pure *Banilla* seed for the irrigated tracts in the Sholapur, Poona and Ahmednagar districts.

During the year under review, 6,000 acres were under *Banilla* and 2,400 bales of improved cotton were produced which were sold at a premium of Rs. 2 per *palla* (240 lbs.) over the *local*. The profit realized by the cultivators by growing the improved cotton is estimated at Rs. 8,000. The operation of the scheme has been shifted from Kopergaon to Indapur *Taluka*.

(d) B.D. 8 Seed Distribution Scheme.—This scheme, which has for its object the distribution and extension of *B.D. 8* cotton, was sanctioned in

August 1935, for a period of three years, and came into operation in December 1935. It was extended, in July 1938, for a period of five years.

During the year under report, 30,951 acres were under *B.D. 8* as against 14,296 acres in 1938-39. The total area under cotton in the Broach district (excluding Ankleshwar *Taluka*) is 250,000 acres. 14,459 bales of pure *B.D. 8* were produced and sold through sale societies and gin-owners at premiums ranging from Rs. 20 to Rs. 39 *'ON'* Broach, against 10,208 bales sold at premiums ranging from Rs. 30 to Rs. 54 *'ON'* last year. The controlled area during the year was 12,718 acres from which 1,68,520 lbs. of seed were obtained. These, together with 860 lbs. obtained from the Broach farm, will be distributed to growers in the 1940-41 season.

(e) Revised Jayawant and Gadag No. 1 Seed Distribution Scheme.—This scheme, which was sanctioned in August 1935, for a period of five years, replaced five seed schemes in the Southern Division of the Bombay province, *viz.*, the Hubli, Gadag, Athani, Haveri and Bailhongal schemes. It came into operation on the 1st June, 1936, and in August 1940, it was extended for a further period of one year from the 1st June, 1941. The aim of the scheme is to eliminate local mixtures and to introduce pure *Jayawant* and *Gadag No. 1* cottons in the Southern Division of the Bombay province, so as to cover within five years, 9½ lakhs of acres with these cottons. The scheme is operated from seven centres, *viz.*, Hubli, Haveri, Navalgund, Bailhongal, Athani, Bijapur and Bagalkot, through the agency of co-operative societies under the general control of the Agricultural Department. Since 1st April, 1939, however, the control of all seed schemes in the Bombay province has been placed under the Registrar of Co-operative Societies and Director of Rural Development. Decentralisation is the keynote of the scheme, the idea being that no single agency should have too great an area to cover or too great a responsibility to shoulder.

During the year under report, 60,27,420 lbs. of pure *Jayawant* seed were sown over an area of 6,28,713 acres, against 30,99,320 lbs. of seed sown over an area of 3,24,197 acres last year. The natural spread of *Jayawant* is estimated at 1,50,000 acres, bringing the total area under this variety to about 7,79,000 acres. 14,08,400 lbs. of pure *Gadag No. 1* seed were sown over an area of 1,33,515 acres, against 11,29,600 lbs. of seed sown over an area of 1,12,944 acres last year. The natural spread of this variety is estimated at 25,000 acres, making a total of 1,59,000 acres. 78,54,000 lbs. of *Jayawant* seed and 18,49,800 lbs. of *Gadag No. 1* seed have been purchased for distribution in the 1940-41 season.

The cultivator's produce was pooled and sold by auction at different centres. In all 28,200 *docras** of *Jayawant* and 22,262 *docras* of *Gadag No. 1* were sold during the year, against 29,108 *docras* of *Jayawant* and 31,895 *docras* of *Gadag No. 1*, last year. The extra profit realised by cultivators is estimated at Rs. 11,13,412 for *Jayawant* and Rs. 3,40,060 for *Gadag No. 1.*

(f) Scheme for maintenance of nucleus of pure seed of improved varieties of cotton.—In pursuance of the policy of the Committee that a nucleus of seed of all approved varieties of cotton should be maintained, a scheme for the maintenance of a nucleus of each of the following seven varieties of cotton was sanctioned in August 1937, for a period of five years :—

(1) *1027 A.L.F.*
(2) *B.D. 8.*
(3) *Jarila* (Bhadgaon).
(4) *Jarila* (Jalgaon).
(5) *Jayawant.*
(6) *Gadag No. 1.*
(7) *Banilla.*

The total area selfed and the quantity of selfed seed of each variety produced during the year are given below :—

Name of Variety.	Area Selfed.		Amount of selfed seed produced.	Remarks.
	Acres.	Gunthas.	Lbs.	
(1) *1027 A.L.F.*	4	30	385	Larger area taken for selfing to take full advantage of short period of boll formation.
(2) *B.D. 8*	1	0	326	555 lbs. of open fertilised seed also produced.
(3) *Jarila* (Bhadgaon)	2	0	300	....
(4) *Jarila* (Jalgaon)	1	0	200	....
(5) *Jayawant*	2	0	284	Poor yield due to boll shedding.
(6) *Gadag No. 1.*	2	0	650	....
(7) *Banilla*	1	0	110	....

* Weight variable, usually about 300/400 lbs.

2. SIND.

(a) **Sind Seed Distribution and Extension Scheme.**—This scheme was sanctioned in December 1930 for a period of three years and came into operation in April 1931. It was extended in August 1933 for five years from the 1st April, 1934, and in November 1938, a further extension for two years was sanctioned. In August 1940, it was extended for a further period of five years from the 1st April, 1941.

The main objects of the scheme are :—

(*a*) Varietal tests of improved strains—Sind American cottons.

(*b*) Trials of high quality cottons—Egyptian and imported American cottons.

(*c*) Demonstration of cotton cultivation on non-cotton growing areas on new barrage lands.

(*d*) Seed multiplication, distribution and extension work.

(*e*) Propaganda, demonstration and advisory work in connection with the extension of improved varieties of cotton and better methods of cultivation.

(*f*) Assistance to cotton growers in marketing cotton.

The work on the Right Bank mainly consists of the extension of cotton cultivation, while on the Left Bank, attention is largely devoted to seed multiplication and distribution of improved varieties of cotton and the introduction of better methods of cultivation.

The work during the year continued on the lines of the past year ; there were 4,67,000 acres under improved varieties, representing 52% of the area under cotton in Sind, against 4,98,500 acres representing 54% of the area in the previous year. 8,214 maunds* of *Sind N.R.*, 33,190 *maunds* of *Sind Sudhar* and 7,293 *maunds* of *4F-98* were distributed during the year, against 15,052 maunds of *Sind N.R.*, 31,518 *maunds* of *Sind Sudhar* and 8,562 *maunds* of *4F-98* distributed last year. 2,06,000 bales of improved cottons were sold at an average premium of Rs. 7-8-0, giving a profit of Rs. 15,43,750 to the growers of improved varieties.

(b) **Scheme for maintenance of nucleus of pure seed of improved varieties of cotton.**—In pursuance of the policy of the Committee for the maintenance of a nucleus of seed of all varieties of cotton, the spread of which has

* 1 maund = 82-2/7 lbs.

been approved by it, a nucleus scheme for the following five varieties of cotton was sanctioned in August 1937 for a period of five years : —

1. *Sind N.R.*
2. *Sind Sudhar.*
3. *4F-98.*
4. *Sea Island 2-4* and
5. *Boss III-16.*

The scheme came into operation in April 1938.

The total area selfed and the amount of selfed seed produced in 1939-40 as well as the area sown in 1940-41 under each variety are shown below :—

Name of variety.	Area selfed in 1939-40.		Selfed-seed produced.	Area sown in 1940-41.
	Acres.	Gunthas.	lbs.	Acres.
Sind N.R.	1	15	230	12.5
Sind Sudhar	2	13	366	10.5
4F-98	1	2	298	15.0
Sea Island 2-4	0	20	94	3.0
Boss III-16				

(c) **Financing of Seed Distribution.**—The Committee, at its meeting held in January 1938, sanctioned a scheme for the financing of seed distribution in Sind for a period of three years, subject to the condition that the scheme would not be put into operation until the rules under the Cotton Ginning and Pressing Factories (Bombay Amendment) Act, 1936, have been brought into force. The scheme has not yet been put into operation.

3. CENTRAL PROVINCES AND BERAR.

(a) **Verum Seed Distribution and Marketing Scheme.**—In November 1929, the Committee sanctioned, for a period of one year in the first instance, the Central Provinces Verum Seed Distribution and Extension Scheme. It started

work in September 1930 and was extended annually up to the end of July 1934, when it was combined with the newly sanctioned scheme for the extension of long staple cottons in the Central Provinces. The combined scheme, known as "Scheme for Extension of Long Staple Cotton and Marketing of Verum cotton in the Central Provinces and Berar" was sanctioned for five years from June 1934. At the meeting of the Committee, held in July 1938, it was extended up to the 31st May 1941 the title being changed to "Scheme for the Extension and Marketing of V. 434 Cotton."

The aim of the scheme is to increase, by at least five times during the currency of the scheme, *V. 434* cotton in the seven *Taluqs* where *Verum* has made most headway in the past, the ultimate object being to eliminate all other short stapled varieties as far as possible. The area under *V. 434* in the whole Province in 1938 was 62,032 acres and in the following year it rose to 86,076 acres in the selected *Taluqs*. In addition, there were 52,349 acres in other parts of the Province, thus bringing the total area under *V. 434* to 1,38,425 acres in 1939. As a result of the pooling operations in 1939-40, 7,081 *khandis** of pure seed were collected, out of which 1,148 *khandis* were taken over by the Government seed depots, and almost double that quantity by *Taluq* Associations for distribution. These, together with the seed returned to growers' will provide ample seed for expansion in 1940. The total number of bales pooled and sold by the marketing section was 8,246 of which 7,744 bales were of *V. 434*. Of the latter total, the special blocks contributed 4,936 bales. The premium obtained was Rs. 23 '*ON*' Broach and Rs. 51/15 '*ON*' Oomras. It is estimated that the total quantity of *Verum* produced in the Province amounted to 40,000 bales by the end of the year. Assuming that this was sold on an average of only Rs. 8 per *khandy* of *kapas*, the cultivators benefited to the extent of Rs. 4.8 lakhs by growing this cotton.

(b) Scheme for Distribution and Marketing of Buri 107 cotton.—This scheme aims at introducing, in the course of three years, *Buri 107*—a selection from acclimatised *Gossypium hirsutum*—in 30,000 acres now under mixed local *Buri*. It was sanctioned by the Committee in July 1938, for a period of three years, and came into operation on the 1st November, 1938.

During the year under report, the stipulated area of 10,000 acres was rogued and 492 *khandis* of first purity seed, sufficient to cover 30,000 acres, were available for distribution in 1940. 408 bales of *Buri 107* were sold through the Department Pool Organization, at an average premium of Rs. 34 '*ON*' Broach and Rs. 60-11-0 '*ON*' Oomras. It is reported that a

* 1 Khandy=784 lbs.

further 1,600 bales were sold in the Burhanpur market. At the Akola farm this cotton is reported to have given an outturn of 330 lbs. per acre.

(c) **Maintenance of nucleus of pure seed of improved strains of cotton.**—This scheme for the maintenance of nucleus of pure seed for each of the cotton strains, *V. 434*, *Late Verum*, *No. 438* and *Buri 107*, was sanctioned by the Committee in July 1938, for a period of five years from April 1939. The following table shows the quantity of selfed seed required to be produced and the quantity actually obtained from one acre each of the varieties :—

Strain.	Selfed seed required to be produced.	Selfed seed produced.
	lbs.	lbs.
V. 434	200	390
Late Verum	200	253
No. 438	200	293
Buri 107	200	380

4. MADRAS.

(a) **Madras Co. 2 Seed Distribution Scheme.**—This scheme was sanctioned by the Committee in August 1932, for a period of five years, for the distribution of *Co. 2* seed in the Salem and Coimbatore districts through the agency of the Tiruppur Co-operative Trading Society by organizing a seed multiplication area of not less than 6,000 acres and distributing enough pure seed for 1,00,000 acres every year. The scheme closed down on the 17th August, 1937. In January 1938, the Committee considered proposals for the extension of the scheme, but sanctioned a grant for one demonstrator and one *maistry* to help the Tiruppur Co-operative Trading Society for a period of one year, after which, it was thought that no further assistance from the Committee should be required. In November 1938, the Committee extended the scheme for the distribution of *Co. 2* seed in Salem district for a further period of four years and five months. The Madras Government have, however, postponed the operation of the scheme.

The following table shows the progress made in respect of acreage under seed farms and the production of seed during the operation of the scheme :—

Year.	Actual area under seed farms	Quantity of seed produced.	Sufficient to cover.
	Acres.	Mds.	Acres.
1932-33	1,739	19,944	20,000
1933-34	4,122	29,596	30,000
1934-35	5,152	53,545	54,000
1935-36	5,320	45,995	46,000
1936-37	5,117	34,947	35,000
1937-38	5,350	52,584	53,000
1938-39	3,200	10,758*	10,800

*Low quantity due to poor and insect damaged crop.

(b) Maintenance of nucleus of pure seed of improved varieties of cotton, Co. 2, H. 1 and K. 1.—This scheme was sanctioned by the Committee in January 1938 for a period of five years and came into operation in September 1938. The area selfed and the quantity of selfed seed produced of each variety during the year are given below :—

Name of variety.	Area selfed.	Amount of selfed seed produced.	How disposed of.
	Acres.	lbs.	
Co. 2	1.0	560	Issued for sowing 28 acres of inner seed farm at Tiruppur.
H.1	2.25	620	Sown on 39 acres at Hagari farm.
K.1	2.0	521	Sown on 32 acres at Koilpatti farm.

5. HYDERABAD STATE.

A *Seed Distribution Scheme* for the Hyderabad State was sanctioned in November 1929 for three years in the first instance and came into operation in March 1930. It was extended, in February 1933, for three years and again in January 1936, for another six months. In August 1936, it was extended for a further period of 4½ years from the 1st September, 1936. The object of the scheme is to introduce improved strains of cotton in the Raichur District and to market the crop under favourable conditions so as to secure a better premium for the cultivator. During the first two years of the scheme, seeds of *Dharwar No. 1* and *Gadag No. 1* were distributed, but as a result of the experiments conducted by the Hyderabad and Bombay Agricultural Departments, the distribution of *Dharwar No. 1* seed was discontinued in favour of *Jayawant* which was found more suitable.

During the year under report, 4,48,821 lbs. of *Jayawant* seed were sown over an area of 35,319 acres and 268 lbs. of *Gadag No. 1* over an area of 20 acres against 2,54,918 lbs. of *Jayawant* over 21,706 acres and 2,520 lbs. of *Gadag No. 1* over 300 acres in 1938-39. The natural spread under *Jayawant* was 37,180 acres. Owing to unfavourable weather conditions, the outturn of *Jayawant* was 31 lbs. of lint per acre against 53 lbs. last year. It is proposed to purchase 5,60,000 lbs. of pure *Jayawant* seed sufficient to cover 40,000 acres in 1940-41.

The Kopbal Co-operative Cotton Sale Society, which was started in 1932, continued to co-operate with the Agricultural Department in the production and sale of pure seed and the holding of auction sales. During the year, sales at auction fetched premiums ranging from Rs. 10 to Rs. 20 '*ON*' Broach.

6. BARODA STATE.

(a) **Baroda (Navsari Seed Storage) Scheme.**—This scheme, which is concerned with the spread of *1027 A. L. F.* in the Navsari district of the Baroda State was sanctioned in February 1933, for a period of five years, subject to the condition that the Baroda Government would arrange a seed multiplication area of 1,000 to 2,000 acres in that district. Work on the scheme started in April 1934. At the meeting of the Committee in July 1938 the scheme was extended for a further period of five years from 1st April, 1939.

During the year under report, 38,908 lbs. of seed raised from pedigreed seed were issued to 'A' class growers for sowing over an area of 2,833 acres,

2,39,870 lbs. to 'B' class growers for sowing over an area of 13,860 acres and 1,87,563 lbs. of pedigreed seed to 'C' class growers for sowing on 9,141 acres. The following table shows the progress of the scheme during the last six years:—

S. No.	Year.	No. of depots opened.	Seed issued.	Area covered by *1027 A.L.F.*	% of *1027 A.L.F.* to total area in district.
1	1934-35	5	231,285	18,382	9
2	1935-36	12	1,020,534	74,456	40
3	1936-37	8	314,433	75,000	33
4	1937-38	8	469,514	50,000	23
5	1938-39	8	449,787	50,000	22
6	1939-40	9	800,798	75,000	37

The produce of the improved seed was ginned and baled at selected centres, and stamped with AGMARK before selling. 6,745 bales of lint were sold at premiums varying from Rs. 5 to Rs. 20 per *khandy*, against about 1,787 bales sold last year at premiums ranging from Rs. 1-10-0 to Rs. 10• per *khandy*.

(b) **Baroda B. D. 8 Seed Distribution Scheme.**—This scheme, which has for its object the extension of *B. D. 8* cotton in Baroda District, was sanctioned in July 1938 for a period of five years and came into operation on the 1st April, 1939.

During the year under report, 83,760 lbs. of *B. D. 8* seed were distributed over an area of 7,680 acres against 81,690 lbs. over 8,000 acres last year. 69,640 lbs. of seed sufficient for 6,268 acres have been stocked for the next season. It is reported that the ginning percentage of *B. D. 8* dropped to 31.2 from 32.25 last year and that this reacted unfavourably on the popularity of the cotton. 780 bales of cotton were sold at premiums ranging from Rs. 21-8 to Rs. 39. Apart from this scheme, the Baroda Government organized seed multiplication over an area of 1,786 acres at Karjan, and 850 bales of *B. D. 8* cotton were produced and sold at premiums ranging from Rs. 17 to Rs. 31.

Since 1929, the undermentioned Seed Distribution and Extension Schemes, financed by the Committee, have closed down after completion of their sanctioned period or for other reasons. The work done under these schemes has been reviewed in previous reports :—

Madras Province :—

(1) *H. I.*

(2) Madras (Tiruppur) Seed Extension Scheme.

Bombay Province :—

(3) Hubli.

(4) Gadag.

(5) Gadag Supplementary.

(6) Athani.

(7) Khandesh (*banilla*).

United Provinces :—

(8) *C. 402.*

Punjab :—

(9) Lyallpur (Ginnery).

CHAPTER IV.

PROGRESS IN THE INTRODUCTION OF IMPROVED VARIETIES OF COTTON.

It is proposed in this chapter to give a brief review of the progress made in the introduction of improved varieties of cotton.

(*i*) BOMBAY.

The total area under cotton in the Bombay Province, including Indian States, during the year 1939-40 was 4,994,000 acres as shown below :—

	Acres.
Total British districts	3,498,000
Total Indian States	1,496,000
Total ..	4,994,000

The area under improved strains was distributed as follows :—

Name of Cotton.	Area (Acres) in 1939-40.	Where concentrated.
(1) *1027 A.L.F.* ..	340,000	Tract lying south of Nerbudda river.
(2) *B.D. 8*	43,000	Broach District.
(3) *Jarila*	70,000	Khandesh.
(4) *Jayawant* ..	851,000	Hubli, Navalgund, Haveri (Dharwar District), Bailhongal, Athani (Belgaum District), Bagalkot, Bijapur (Bijapur District), Tasgaon in Satara District.
(5) *Gadag No. 1* ..	164,000	Gadag and Ron (Dharwar District).
(6) *Banilla*	37,000	Deccan Canals, Ahmednagar and Sholapur Districts.
Total ..	1,505,000	

(1) *1027 A.L.F.* was evolved from a cross between *Kumpta* and *Goghari* cottons. It has a staple length of 15/16" and a ginning percentage of 33 to 36 and is capable of spinning up to 38 counts. It fetches a premium of Rs. 10 to Rs. 15 per *khandi* on local rate. During the past year, the department purchased in all 21,74,217 lbs. of seed of this cotton, 22,614 lbs. of this being the produce of the Surat farm. From this stock, 14,95,645 lbs. were distributed in the district through 24 seed depôts opened in the interior and 6,78,572 lbs. were supplied to the Rajpipla State. In addition, 99,416 lbs. of seed were distributed direct by the Hansot Co-operative Cotton Sale Society. The total quantity of seed distributed was thus 22,73,633 lbs. As a result of the passing of the Amended Cotton Transport Act of 1923, restricting the transport of seed cotton and cotton seed from the north of the Tapti into the Surat area, there was a large demand for the seed of *1027 A.L.F.* and the majority of co-operative cotton sale societies in Olpad and other societies in the remaining part of the district changed their policy in favour of growing *1027 A.L.F.*

(2) *B.D. 8* was originally selected from a cotton variety known as "Purified Broach *Deshi*" grown on the Broach Farm. It has a staple length of 0.90" and a ginning percentage of 33.7 and is capable of spinning 37 counts. In the Broach district, the area under *B. D. 8* cotton is extending, as this strain has been found to be highly wilt-resistant compared with the local cottons like *Goghari* and *Broach desi*. Out of the total area grown under *B.D. 8* cotton in this district, 12,716 acres were controlled by the Agricultural Department. The crop in the controlled area was inspected and 1,69,520 lbs. of seed from this area were purchased by the department for further distribution. *B.D. 8*, during the year, fetched a premium of Rs. 9 per *bhar* of 1,020 lbs. of seed cotton and Rs. 43 to Rs. 55 per *khandi* of lint over *Broach*.

(3) *Jarila cotton.*—As a result of breeding work on *Verum* cotton at the Jalgaon Farm, a new *Verum* selection now known as *Jarila* cotton has been evolved. It is wilt resistant and possesses fine staple (13/16"), capable of spinning 24 counts under mill conditions. With a ginning percentage of 33 to 35, it obtained during the year a premium of Rs. 13 to Rs. 34 on *Broach*, against Rs. 38 to Rs. 48 'ON' in the previous year. It is suited to the conditions obtaining in the Khandesh tract and is much appreciated by the cultivator and the trade. During the year under review, 6,84,536 lbs. of seed, sufficient to cover 30,000 acres, were distributed under departmental control. In addition, there were about 196 acres under this cotton on the Jalgaon and Bhadgaon farms. It is estimated that there was an area of about 40,000

acres, under it by natural spread. Out of the pure seed produced on Government farms and on the controlled area, 9,04,000 lbs. were earmarked for distribution during the ensuing season.

(4) *Jayawant* is an isolate from a cross between *Dharwar I* and *Dharwar II*—two selections from local *Kumpta* cotton. It has a ginning percentage of 28 and is capable of spinning upto 40 counts. It is highly wilt-resistant under field conditions, and combines all the good characters of its parents.

(5) *Gadag No. 1* is a selection from the local *Dharwar-American* cotton. It has a staple length of $\frac{7}{8}$" and a ginning percentage of 33 and is capable of spinning up to 30 counts. The work of extending the two improved varieties of cotton, *viz.*, *Jayawant* and *Gadag No. 1*, was carried out on an extensive scale through the local agents and the Hubli, Gadag, Annigeri, Nargund and Bijapur Co-operative Cotton Sale Societies. The total reserved area maintained for multiplying pure pedigree seed of *Jayawant* at different centres was 97,749 acres as against 66,163 acres last year, while the reserved area under *Gadag No. 1* at Gadag and Ron centres was 31,120 acres against 23,156 acres in the previous year. The quantity of seed secured and stocked by the local agents and the co-operative cotton sale societies from these reserved areas was about 72,72,260 lbs. of *Jayawant* and about 15,53,400 lbs. of *Gadag No. 1*, sufficient to cover 7,27,226 and 1,55,340 acres, respectively, during 1940-41. In auction sales, *Jayawant* obtained on an average a premium of Rs. 15 and *Gadag No. 1* Rs. 25 per *naga* of seed cotton (1344 lbs.) over local cottons in the *bazaar*. *Jayawant* cotton is spreading in the Walwa and Tasgaon *talukas* of the Satara district also, where 21,588 lbs. of *Jayawant* seed, sufficient for about 2,200 acres, were supplied to the cultivators. The natural spread is estimated to be about 800 acres, making the total area under *Jayawant*, in the year, to be about 3,000 acres. The premium obtained for *Jayawant* cotton in the Sangli market ranged from Rs. 4 to Rs. 8 per cart over the local cotton.

(6) *Banilla* is a derivative of a cross between *bani* (a long staple, fine, silky but low ginning cotton) and *comilla* (a short staple but very high ginning cotton). The staple length of *Banilla* is 22/32" and ginning percentage 39 and it has been adjudged suitable for spinning 19s highest standard warp counts. It is, however, very susceptible to wilt and is, therefore, being replaced by *Jarila* in the Khandesh tract. Owing to its susceptibility to wilt the yield of *Banilla* has gradually gone down from 1,500 lbs. to 750 lbs. of seed cotton per acre.

(*ii*) SIND.

The total area under cotton in Sind during the year was about three times that during the decade preceding the opening of the Lloyd Barrage Scheme. The final estimated area under cotton in Sind (including Khairpur State) during the year under report was 904,000 acres against the revised figure of 902,000 acres in 1938-39. During the pre-Barrage decade, out of the total cotton acreage of 320,000 the area under American cotton was 25,650 acres, whereas, during 1939-40, out of the total of 904,000 acres, approximately 664,000 acres were under American. This increase is due to the assured and perennial supply of irrigation water, the extension of cultivation of improved and high yielding varieties and the introduction of better methods of land preparation and tillage. The present average yield per acre of the various cotton growing districts, given below, is nearly double that during the pre-Barrage decade :—

Hyderabad district	..	..220 lbs. (average).
Nawabshah district	..	..210 ,, ,,
Tharparkar district	..	..240 ,, ,,
Right Bank ..	..	..220 ,, ,,

Improved varieties.—The three main varieties found successful in Sind are Sind *desi*, *Sind-American* and imported Egyptian and Sea Island cottons. From these, by selection, improved strains have been evolved which on account of better yields, high ginning outturn and superior spinning quality have been found suitable for extension in general cultivation.

The total area under improved varieties during 1939-40 was 515,000 acres as shown below :—

		Acres
(*i*)	*Sind Sudhar*	250,000
(*ii*)	*4F-98*	63,000
(*iii*)	*Sind N.R.*	202,000
	Total ..	515,000

(*i*) *Sind Sudhar* has full 1″ staple and spins about 40 counts. It is a high yielding cotton with a ginning percentage of about 29 to 30 in normal years. It is resistant to red leaf blight and jassid attack and can withstand seasonal variations of climate better than the ordinary *289-F* and other similar cottons. It is now grown all over the Indus Left Bank. The good premium obtained by this cotton during the last five years has resulted in a considerable increase in area under it. The Department distributed 34,980 *maunds* of seed of this strain for multiplication during the season 1940-41.

(*ii*) *4F-98*, which has been evolved from the *4F* ordinary cotton, has a staple length of $\frac{7}{8}$" to 15/16" and is capable of spinning 34 counts. Its ginning outturn is 33% and it has been found to be the most suitable type for cultivation in the new cotton growing tracts on the right bank of the river Indus. About 7,309 *maunds* of seed of this strain was distributed by the Department amongst *zamindars* for the coming season.

(*iii*) The improved Sind *desi* cotton, known as Sind *N.R.*, is the standard *desi* cotton of Sind, occupying an area of about 225,000 acres. Its cultivation is confined to Nawabshah and upper part of Hyderabad District. Its yield is about 16 to 20% higher than the ordinary Sind *desi*. It possesses the further advantage of being a good ginner, the ginning outturn being 4 to 5% higher than that of ordinary *desi*. The Department distributed about 11,802 *maunds* of the improved seed of this strain for further multiplication in the year 1940-41.

(*iii*) PUNJAB.

The total area under cotton in the British districts of the Punjab was 2,641,105 acres, of which 93% was irrigated and the remainder unirrigated. The area under cotton represented a decrease of 9% on that of the previous year and nearly 16% on that of two years ago, when the record area of 3,135,531 acres was under cotton in the Punjab. The reduction in both the cases was due to inadequacy of rainfall at sowing time coupled with the effect of the low prices obtained for cotton in the previous year.

Of the total area under cotton, 1,432,000 acres were under *Punjab-American* varieties; thus the record established last year when *Punjab-American* cotton occupied 53.6% of the total cotton area in the Province was maintained. This year, the percentage of *Punjab-American* to the total cotton area was 54.2. The total baled crop according to press returns was 10,80,770 against 11,15,561 bales of 400 lbs. each in the previous year.

So far, as it has been possible to estimate, the area under improved varieties was roughly as follows :—

(*a*) *Punjab-American varieties* :—

	Acres.
(*i*) *4F*	992,000
(*ii*) *L.S.S.*	153,000
(*iii*) *289F/43*	122,000
(*iv*) *289F* including *K.T.* types	165,000
Total ..	1,432,000

(*b*) *Improved Desi cottons.*—		
(*v*) *Mollisonis*		660,000
(*vi*) *119 Sanguineum*		10,000
(*vii*) Other types		539,105
	Total ..	1,209,105

(*i*) *4F* was first distributed by the Department of Agriculture in 1914. The fibre length of this variety is $\frac{7}{8}$″ and it spins 20 to 25 counts. The ginning outturn is about 31%. A few years ago, it was the most important variety of American cotton in the province, but now it is being replaced by new improved strains suited to different tracts. The seed of this cotton is stocked by the Agricultural Department's seed selling agencies, and the *zamindars* are advised to buy all their requirements from them.

(*ii*) *L. S. S.* is a selection from *4F* and is chiefly grown in Lyallpur, Sheikhupura and parts of Sargodha districts. Its fibre length is 1″ and it spins 40 counts. The ginning outturn is about 31%. When marketed in bulk, *L. S. S.* fetches a better price than *4F*. It is a high yielding cotton, but matures late, and, therefore, requires one or two irrigations in October.

(*iii*) *289F/43* is a long stapled, high yielding, early maturing variety of Punjab-American cotton. It is resistant to the attack of jassids. The fibre length is 1-1/32″ and it spins 40 counts. The ginning outturn is 29%. The most noteworthy features of this strain are its tolerance to the shortage of water and its early maturing habit. In fact, it matures and gives the first picking along with *desi* cottons and, therefore, does not suffer from early frost. It is most popular in lower Bari Doab Canal Colony (except Khanewal Division), Nili Bar and inundation tracts. It has also proved successful in Lower Chenab Canal Colony. It withstands late sowing better than other varieties, especially in south-western parts of the province, and if, for any reason, late sowings up to the end of June have to be done, this variety should be preferred. Its low ginning outturn of only 29% compared with 33% in the case of *289F/K.25*, however, places it at a distinct disadvantage and despite the high quality of its lint, the market quotations for its *kapas*, during the year, were a few annas per *maund* less than those for cotton of poorer quality.

(*iv*) *289F/K.25* was selected by the British Cotton Growing Association (Punjab) Ltd., Khanewal, in 1932, and is at present grown over about 2 lacs of acres in parts of Multan and Montgomery districts. It is also being grown in parts of Bahawalpur State and Sind. The ginning outturn of this variety is 33%; the staple is also good and it has been adjudged suitable for spinning 40s highest standard warp counts. It is, however, very susceptible to jassids.

(*v*) *Mollisoni 39* is a tall growing variety and has a lint length of 5/8" and a ginning percentage of 35 to 36. Its yield is the highest amongst all the *desi* varieties and it has now become so popular with the growers of *desi* cotton in the Canal Colonies that, during the last three years, the demand for its seed has always exceeded the supply.

(*vi*) *119. Sanguineum* is another improved strain that bids fair to become the standard *desi* cotton of the south western tract. It gives higher yields than the local and its ginning outturn is 36% against 34% of the local *desi*. The market value of this cotton, at present, does not differ materially from the old variety, but when it becomes widely known, it will probably command a better price.

(*iv*) CENTRAL PROVINCES AND BERAR.

The total area under cotton in the Central Provinces and Berar during 1939-40 was 3,370,631 acres.

(*i*) The area under *V. 434* was 138,425 acres as compared with 63,700 acres in the previous year. *V. 434* is a pure line selection, evolved in 1932; its chief merit lies in its adaptability to varying conditions of soil and climate. It possesses, in addition to wilt resistance qualities, drought resistance, prolific flowering capacity, quickness in forming buds and setting fruit, comparative freedom from shedding and excellent lint characters and good ginning percentage. Its staple length is about 1" and it has been adjudged suitable for spinning 30s to 37s highest standard warp counts; the ginning percentage is 31. It is the best all round strain available at present and it is grown chiefly in the districts of Akola, Amraoti, Buldana, Yeotmal, Nimar, Wardha and Nagpur. The Agricultural Department has now decided to expand its cultivation also in the *taluks* of Chikhli, Mehkar, Basim, Pusad, Ellichpur, Khandwa and Harsud. 7081 *khandis* of pure seed of this cotton were collected during the year. Of this, 1,148 *khandis* were taken over by Government depôts for direct distribution. Approximately double that amount was taken by Taluk Agricultural Associations and the rest was returned to the growers. The premium obtained during the past season was Rs. 56 per *khandy* over the local *Oomras*. The total production of improved *Verums* during the season was nearly 40,000 bales.

(*ii*) The area under *buri 107*, which is a selection from acclimatised Upland American cotton, rose to 10,000 acres in the Burhanpur *tahsil* for which it has been found to be particularly suitable. A seed distribution scheme for this cotton has recently been sanctioned by the Committee and this was the second year of its working. No difficulty is anticipated in raising the area

under it to 30,000 acres in 1940. 154 *khandis* or pure seed of *buri 107* were taken over by Government seed depôt for distribution and further 338 *khandis* were left to be distributed either by the cultivators themselves or by the Taluq Agricultural Associations.

Buri 107 yields well but suffers from the defect of being a low ginner (27 to 28%). The staple is good, though somewhat weak, and it has been adjudged suitable for spinning up to 40s highest standard warp counts.

(*v*) MADRAS.

The total area under cotton in Madras during 1939-40 was 2,102,900 acres, the *Karunganni* cottons grown in the 'Salems' and 'Tinnevellies' tracts occupying 2,15,914 acres, *Cambodia* 3,69,800 acres, *Cocanadas* 1,07,200 acres and the *Northerns* and *Westerns* 9,61,000 acres. So far as it has been possible to estimate, the area under improved varieties was roughly as follows :—

Cambodia Cotton :—

Name of Strain.	Name of District.	Area of seed-farm in acres.	Seed Distributed by		Total area of improved strain in acres.	Premium paid per lb. of 400 lbs.
			Department. lbs.	Private agency. lbs.		Rs.
Co. 2 in Southerns areas.	Coimbatore { D. / N.D.	830 / 2,980	2,34,682	6,43,330	1,42,022	7- 8-0 to 11-12-0
	Salem .. .. D.	536¼	37,912	..	19,382	
	Madura .. D.	419	31,098	..	55,000	
	Trichinopoly	..	6,388	..	9,424	
	Ramnad	..	..	..	3,618	
	South Arcot	..	8,490	..	7,503	
	North Arcot	..	6,900	..	685	
	Tinnevelly	..	..	..	1,490	
Co. 2 in other areas.	Bellary & Anantapur	..	972	3,100	410	
	Kurnool & Cuddapah	..	1,583	856	271	..
	Northern Circars ..	..	..	..	26	
920	Ramnad, Coimbatore and South Arcot.	93	32,639	1,405	10,156	
1267	Trichinopoly ..	..	1,000	..	393	
x*3915*	Ramnad	58	..	..	800	Rs. 25 on *Co. 2.*
x*4383*	Ramnad and South Arcot.	770	330	..	3,170	Do.
x*4463*	Coimbatore	..	..	..	320	
		5,686			2,54,670	

D = Departmental. N. D. = Non-Departmental.

Karunganni Cottons :—

Name of Strain.	Name of District.	Area of seed farms in acres.	Seed Distributed by		Total area in acres.
			Department. lbs.	Private agency. lbs.	
K. 1	Madura	130	10,568	Not known.	11,050
	Trichinopoly ..	....	1,896	....	328
	Tinnevelly .. }	797			58,328
	Ramnad .. }				46,993
	Coimbatore.. ..	617	....	....	15,640
	Total ..				1,32,339
C. 7 ..	Tinnevelly				15,500
	Coimbatore ..	151			35,967
	Total ..				51,467
A. 10 ..	Madura				8,000
	Trichinopoly ..				110
	Tinnevelly				750
	Ramnad				23,248
	Total ..				32,108
				GRAND TOTAL	2,15,914

Northerns Tract :—

Name of Strain.	Name of District.	Area of seed farms in acres.	Seed Distributed by		Total area in acres.	Premium paid per bale. Rs.
			Department. lbs.	Private agency. lbs.		
N. 14 ..	Kurnool	1,414	98,796 ..	54,734	15,353	16
H. 1 ..	Kurnool	..	1,050 ..	49,950	5,100	Nil.
	Cuddappah	127 ..	5,030 ..	25,090	3,012	,,

Westerns Tract :—

Name of Strain.	Name of the District.	Area of seed farms in acres.	Seed Distributed by		Area under improved strains. Acres.	Premium paid per bale. Rs.
			Department. lbs.	Private agency. lbs.		
H. 1 ..	Bellary & Anantapur.	2,989	1,93,219	23,28,840	2,49,600	4

Cocanadas Tract:—

Only 100 acres were under an improved strain *X20*.

The *Westerns* and *Northerns* form the biggest group as regards total area. The acreage and yields, however, fluctuate considerably, as the regions in which these cottons are grown are liable to suffer from frequent droughts and famines. The most important improved strain evolved in the *Westerns* and *Northerns* cottons are *H. 1* and *N. 14*, respectively. *H. 1* (*Gossypium herbaceum* var *frutescens Delile*) which is a selection from another strain, *H. 25*, has a ginning percentage of 31, against 27 of the commercial *Westerns* and is grown on the black soils of Bellary district and in parts of Anantapur district. *N. 14* (*Gossypium arboreum* var *neglectum* forma *indica H. & G.*) which was evolved by single plant selection in the *Northerns* cottons is considered to be one of the finest indigenous cottons of India. It has a staple length of 1″ and a ginning percentage of about 24. The bolls, however, open badly and, therefore, it is somewhat difficult to pick. It thrives best on mixed soils in years of good rainfall.

Cambodia is the next important cotton. The total output of *Cambodia* has risen considerably, as a result of the increase that has taken place in the area under improved strains. *Co. 2*, a selection from *Cambodia*, is a robust, jassid resistant, high yielding type and possesses large bolls which open widely. It has a lint length of about 1″ and a ginning percentage of 33 to 35 and is estimated to benefit the grower to the extent of Rs. 15 per acre. Recently, two more strains, *viz.*, *920* and *1267*, have been introduced and are gradually replacing *Co. 2* in Coimbatore and Srivilliputhur *taluks* on account of their sturdier growth and less susceptibility to shedding. Two more strains which deserve mention here are x *3915* and x *4383*, now called *Co. 3* and *Co. 4*, respectively, both of which are earlier and more prolific than either *Co. 2* or *920*, and are at the same time superior in respect of quality. Strain x *4383* is a derivative from a cross between *Co. 2* x *A. 12* (a South African cotton) and was evolved at the Cotton Breeding Station, Coimbatore, in 1936. It is earlier than *Co. 2* by about three to four weeks, but although better in staple and capable of spinning 40s to 42s its ginning percentage is only 31 against 33 to 35 of *Co. 2*. It is, however, valued at Rs. 20 '*ON*' best *Cambodia*, and in the Ramnad district, where it was tried during the past few seasons, it gave 50 to 80% higher yield than *Co. 2*. This year it has been grown on an area of 1,000 acres. Similarly, strain x *3915* has been obtained by hybridising *Co. 2* with *U. 4* (a South African Cotton). It is as early as x *4383*, but is finer in staple and higher in ginning outturn (36 to 39%) than the latter. They are capable of spinning 42s to 50s highest standard warp counts.

The *Tinnevellies* include all *Karunganni* cottons grown in the province. As is well known, the commercial 'Tinnies' is a mixture of two cottons—*Karunganni* and *Uppam*. The former is distinctly superior to the latter in general yield and quality, as well as spinning performance. As a consequence, it brings in more money to the grower. The area under improved *Karunganni* has increased (especially in Coimbatore and Tinnevelly districts) from 83,273 acres in 1930-31 to over 200,000 in 1938-39. The improved strains evolved under this cotton are *C. 7*, *A. 10* and *K. 1*. These have been evolved by selection in *Karunganni* at Koilpatti Agricultural Research Station. *C. 7* is suitable for tracts south and east of Koilpatti, while *A. 10* flourishes best in the regions north of Koilpatti. Both are alike as regards lint length and ginning percentage, but in spinning performance *C. 7* is superior. *K. 1*, on the other hand, was evolved by re-selection in *C. 7* in a year of drought. It is earlier and hardier than the latter, and thus does better than either *C. 7* and *A. 10* under adverse conditions. It is not affected by February rains, and has been found to give a higher yield then the local cottons. Owing to its earliness, drought resistance and non-shedding qualities, it is gaining ground and is expected soon to replace *C. 7* and *A. 10*.

Very little improvement has so far been effected in *Cocanadas* and *Salems* (excluding *Karungannies* grown in Coimbatore). Recently, however, a scheme for the improvement of *Cocanadas* cottons has been sanctioned by the Committee and it is hoped that suitable improved types will be developed in the course of a few years.

(*vi*) UNITED PROVINCES.

The total area under cotton in the United Provinces during 1939-40 was 4,83,649 acres. The area under improved strains is estimated to be :—

(*i*)	*C. 520*	33,000	acres.
(*ii*)	*Perso-American*	2,374	,,
	Total ..	35,374	

(*i*) *C. 520* is a selection superior in quality and yield to the bulk crop of indigenous mixture of "U. P. Bengals." It possesses a staple of 5/8" and is capable of spinning 12 to 16 counts. The ginning outturn is 38%. The most noteworthy feature of this variety is its tolerance to vagaries of climate and early maturing habit associated with high yield. It is gaining popularity not only in the cotton tracts of the Province but also in certain Rajputana States.

(*ii*) *Perso-American Cotton.*—An acclimatised foreign cotton, has a staple length of 25/32″ and a ginning outturn of 32%; it spins 30s counts. Attempts are being made to extend the area under this type in Aligarh and Badaun districts.

(*vii*) HYDERABAD STATE.

The total area under cotton cultivation in H. E. H. the Nizam's Dominions during the year 1939-40 was 3,187,894 acres.

Gaorani Tract.—4,388,160 lbs. of pure seed of *Gaorani 6*, which is a selection from the indigenous *Gaorani* cotton of the State, was purchased by the Department from the Reserved area of the last year and distributed on *tacavi* system, under Departmental control, to cover an area of 241,633 acres.

Aurangabad District.—Pure seed of an improved strain, namely, *Parbhani-American*, which is a selection from the local American varieties, obtained from the Reserved area of the last year amounting to 18,480 lbs., was purchased by the Department and distributed on *tacavi* system under Departmental control for an area of 1,848 acres to be multiplied up for general distribution.

Raichur District.—In the Kumpta Cotton Protected area of Raichur district, which is situated to the extreme south-western portion of the Hyderabad State, the work of seed distribution of improved varieties of cotton, namely, *Jayawant* and *Gadag No. 1*, was continued. The total quantity of seed distributed by the Department of Agriculture was 448,821 lbs. of *Jayawant* and 268 lbs. of *Gadag No. 1*. The improved varieties covered an area of 35,319 and 20 acres, respectively. The natural spread under *Jayawant* was 37,180 acres, thus bringing the total area under the improved varieties to 72,519 acres.

(*viii*) BARODA STATE.

Navsari District.—Pure seed of *1027 A.L.F.*, issued by the State Seed Organisation to growers in the Navsari District, amounted to 9,82,410 lbs., this is expected to cover an area of 1 lac acres. In addition, the Organisation supplied 5,20,800 lbs. of pedigree resultant seed to Rajpipla State. The Vesma Farm issued 34,295 lbs. of pedigree seed to be sown by 'A' grade seed farmers in 1940.

Baroda District.—68,745 lbs. of *B.D. 8* seed were issued. This was either pedigree seed from the Daboi Farm issued to 'A' grade seed farmers or 'A' Grade Seed issued to 'B' Grade growers. It is expected that there will be about 6,300

acres under 'A' and 'B' Grade growers of the seed organization. The lower ginning percentage of 1939-40 together with the smaller influence of the premium under general high cotton prices reacted against this cotton last year, so that, except for *kapas* of guaranteed purity, the growers got Rs. 5-10 less per *bhar* than for *desi*. This has led to a shrinkage of area of the commercial crop.

(*ix*) RAJPIPLA STATE.

The total area under cotton in the State was 1,51,089 acres, the whole being sown with *1027 A.L.F.* The seed was obtained, as usual, through the Cotton Superintendent, Surat, and supplied to the *Kheduts* by the State.

The import and sowing of *Goghari* or any other short staple cotton has been prohibited under the Rajpipla Cotton Improvement Act of 1921. The export likewise of cotton by rail or by boat is entirely prohibited except in the form of fully pressed bales, an exception being made only in favour of bona-fide *Kheduts* who are allowed to take their cotton in carts for sale outside the State. As a result, the cotton of the State has attained a reputation for purity and finds ready sale in the market and at a premium.

CHAPTER V.

COTTON STATISTICS.

Statistics of cotton production and of factors affecting it, are of fundamental importance to the cotton grower and the trade alike. This is easy to understand when it is realised that production is subject to wide fluctuations, not only because of changes in acreage but also because of changes in yield per acre through natural causes, so that the supplies of cotton available are constantly changing. These variations are in their turn reflected in fluctuations in the prices of cotton. The main object of this chapter is to present a general view of the supply and consumption of Indian cotton and the trend of demand for the various types, so far as it has been found possible to obtain statistical information on the subject.

1. ACREAGE, YIELD AND PRODUCTION ESTIMATES.

India ranks second amongst the cotton growing countries of the world; on the average of the five years ending 1938-39, production of Indian cotton represented some 18% of the total world production, the share of the U.S.A. being 41%. The total area under cotton in India, during the year under review, was 21,356,000 acres, showing a reduction of 2,126,000 on the acreage of the previous year. The decrease was recorded mainly in the Provinces of Bombay, the Central Provinces and Berar, the Punjab and the United Provinces and Hyderabad State; this was partly due to the lateness of the season in the Bombay Province and scarcity or inadequate rainfall at the time of sowing in the other areas mentioned. In the Central Provinces and Berar, in spite of the reduced acreage, the total crop showed a recovery over the previous year, owing to comparatively more favourable weather conditions.

The total estimated outturn for 1939-40 was 4,984,000 bales, against 5,076,000 bales, in 1938-39, the average yield per acre being 93 and 87 lbs. respectively.

The quantity of cotton pressed, including loose cotton consumed in mills in India during the year and the extra-factory consumption of cotton taken at 450,000 bales, was 5,803,000 bales of 400 lbs. each.

The ascertained area under improved strains of cotton was 5,760,000 acres or 27% of the total, against 24% in the previous year. That, with the introduction and extension of improved varieties of cotton, the character of

the Indian cotton crop has gradually been undergoing a change, will be apparent from the following table :—

CHANGE IN THE CHARACTER OF THE INDIAN COTTON CROP.

Indian cotton crop classified according to varieties and length of staple.

(Based chiefly on the ' Estimates of Area and Yield of Principal Crops in India ' and ' Cotton Forecasts ' published by the Department of Commercial Intelligence and Statistics in India).

(Excludes Burma). Quantities are in thousand bales* of 400 lbs. each.

Descriptions of Cotton.	Average 1928-29 to 1932-33.	Average 1933-34 to 1937-38.	1938-39.	1939-40.	Percentage increase (+) or decrease (—) of col. 5 over col. 2.
1	2	3	4	5	6
Short staple—below ⅞".					
1. Bengals	906	1,349	1,012	979	
2. Oomras	1,734	1,344	1,085	1,220	
3. Central India ..	278	247	260	175	
4. Broach (Part) ..	58	163	233	242	
5. Dholleras	557	557	328	228	
6. Kumpta and Upland (Part)	(*a*)	(*a*)	50	34	
7. Bijapur and Bagalkot Jowari	(*b*)	(*b*)	173	39	
8. Westerns (Part) ..				103	
9. Warangal and Cocanadas	36	25	26	35	
10. Salems	37	34	4	4	
11. Chinnapathi	37	42	1	1	
12. Comillas			42	40	
Total— Quantity ..	3,643	3,761	3,214	3,100	—15
Short staple % on 'Total All Staples'	74	68	63	62	

* Statistical bales containing 400 lbs. of cleaned (lint) cotton.

(*a*) Included under item (19), separate figures not being available.

(*b*) " " " (20), " " " " "

Descriptions of Cotton.	Average 1928-29 to 1932-33.	Average 1933-34 to 1937-38.	1938-39.	1939-40.	Percentage increase (+) or decrease (—) of col. 5 over col. 2.
1	2	3	4	5	6
Medium and Long Staple— $\frac{7}{8}$*" and above.*					
13. *Americans*†—Punjab and Sind—(Staple 1" and above) ..	(*c*)	‡88	172	217	
14. *Americans*—Punjab and Sind—(Staple below 1")	244	691	891	700	
15. Central Provinces and Berar *Verum* ..	(*d*)	26	23	37	
16. Hyderabad *Gaorani*	126	135	127	143	
17. Broach (part) ..	210	137	10	15	
18. Surti			175	195	
19. *Kumpta* and *Upland* (part)	232	170	174	199	
20. *Westerns* (part) ..	223	196	43	34	
21. White and Red *Northerns*			22	23	
22. *Tinnevellies* (including *Karungannies*) ..	144	139	123	158	
23. *Cambodias*	129	192	99	122	
24. *Jarila*	..	..	3	24	
25. *Buri*	..	..	..	17	
Total—Medium and long staple .. Quantity ..	1,308	1,774	1,862	1,884	+44
Total—Medium and long staple .. % on 'Total All Staples.'	26	32	37	38	
Total—All Staples ..	4,951	5,535	5,076	4,984	+1

† Includes "Punjab-American 289-F," "Sind *Sudhar* (Sind-American 289-F-1)" and "Punjab-American 289-F/43."

‡ Excludes "Punjab-American 289-F/43"; figures for this variety, not being available for the complete five year period, have been included under item (14).

(*c*) Included under item (14), separate figures not being available.

(*d*) " " " (2), " " " " "

It will be seen that the proportion of cotton of staple length $\frac{7}{8}$" and above to the total production increased from 26% in the quinquennium 1928-33 to 32% in the quinquennium 1933-38; the proportion in 1939-40 was 38%.

There has also been a noticeable improvement in the yield per acre, as will be seen from the following table, in which two sets of figures, one based on the official crop forecasts and the other on the figures of actual crop accounted for by mill consumption, exports and extra-factory consumption, are given :—

CHANGES IN YIELDS OF COTTON IN INDIA.

(Excludes Burma).

Year. (1st Sept.-31st Aug.)	Area. (Thousand acres).	Production. Government estimates. (Thousand bales of 400 lbs. each).	Yield per acre. (lbs.). Col. 3 / Col. 2	Production of cotton of staple length $\frac{7}{8}$" and above. (Government estimates). Actual. (Thousand bales of 400 lbs. each).	Per cent on total.	Approximate (Commercial) crop. (Thousand bales of 400 lbs. each).	Yield per acre calculated from approximate (Commercial) crop. (lbs.). Col. 7 / Col. 2
1	2	3	4	5	6	7	8
Average 1922-27 ..	24,723	5,449	87	1,622	30	*5,954	96
„ 1927-32 ..	24,738	5,206	84	1,327	25	*5,851	95
„ 1932-37 ..	23,912	5,315	89	1,650	31	*6,447	108
1937-38 ..	25,746	5,722	89	1,770	31	†6,370	99
1938-39 ..	23,482	5,076	87	1,866	37	†6,051	103
1939-40 ..	21,356	4,984	93	1,884	38	†5,868	110

* Calculated from mill consumption (*a*) + exports (*b*) + extra-factory consumption (*c*). Variation in stocks has not, however, been taken into account.

(*a*) Mill consumption in Burma included up to 31st March 1937.

(*b*) Includes exports from Burma up to 1934-35.

(*c*) The new figure for extra-factory consumption, *viz.*, 450,000 bales for the whole of India, based on enquiries conducted by the Committee, in selected areas, has been used throughout.

† Best estimate of the crop as arrived at by the Indian Central Cotton Committee in connection with the annual post-mortem examination of all-India cotton forecasts.

From the second set of figures given in column 8, it will be seen that the average yield per acre rose from 96 lbs. in the quinquennium 1922-27 to 108 lbs. in the quinquennium 1932-37. The average yield in 1939-40 was 110 lbs. per acre.

By the issue of bulletins, leaflets and press notes, from time to time, during the year, the grower and the trade were kept in touch with the statistical position of Indian cotton.

2. IMPROVEMENT OF COTTON FORECASTS.

The Final Report of the Bombay Cotton Forecast Improvement Scheme, to which reference was made in the last year's report, was published for general information, during the year under review, and the attention of provincial and State forecasting authorities was drawn to the recommendations contained in the Report.

In connection with the adoption of the tentative estimate of 450,000 bales per annum for the extra-factory consumption of cotton for the whole of India, it was felt that the figure of 233,000 bales, taken for the Punjab and included in the all-India estimate, was probably on the high side, owing to the fact that the figure of *per capita* consumption of the investigated villages was applied to rural (village) as well as to urban (town) population. It was accordingly decided to undertake a separate investigation to ascertain the consumption, for domestic purposes, of cotton in towns in the Punjab, and a small grant for the purpose was sanctioned by the Committee. This investigation showed that the difference between the rural and urban *per capita* consumption figures was not considerable and that the estimate of total urban consumption in the Punjab, arrived at from the present enquiry, is less than that based on the original enquiry by only 1,245 bales. It has, therefore, been decided not to modify the estimate of 233,000 bales adopted at present, for the Punjab.

As reported before, the all-India cotton forecasts of each season are subjected to a post-mortem examination, by the Cotton Forecast Sub-Committee of the Indian Central Cotton Committee, at the close of the season, with a view to detecting sources of errors and suggesting remedial measures. During the year under report, as a result of the examination of the all-India cotton forecasts of 1938-39 season, the question of applying a correction factor to the anna valuation figures reported for Sind and the Gujerat block of the Bombay Province, is at present under consideration. Further, with a view to rectifying the sources of errors revealed by such post-mortem examinations, the forecasting authorities of the Provinces and States have been requested to give effect, as far as possible, to the recommendations contained in the Final Report of the Bombay Cotton Forecast Improvement Scheme, which have been approved by the Committee.

One of the factors used in the preparation of cotton forecasts in India is the "standard yield," which may be defined as "an average crop on average soil in an year of average character." The standard yields were fixed for each district several years ago and have not been materially revised since, except

in the Provinces of Bombay, Sind and the Punjab, where the standard yields were re-fixed recently after examination of the available data. The position was reviewed by the Indian Central Cotton Committee and it was felt that in order to improve the cotton forecasts, a systematic and scientific revision of the standard yield figures was desirable, the first essential being the devising of a proper sampling technique for obtaining the average yield. The major cotton growing provinces were accordingly invited to submit proposals for crop-cutting experiments on cotton in limited areas and a co-ordinated scheme of crop-cutting experiments on cotton on an all-India basis was formulated. The co-ordinated scheme, together with the views on it of the provincial authorities concerned, was examined by a Special Sub-Committee and on its recommendation, a scheme has been sanctioned for one year, in the first instance, at a total cost of about Rs. 20,000 for the Punjab, the Central Provinces and Berar and Madras. This scheme is essentially of an exploratory nature; the object is to determine the optimum density of sampling and the optimum size of a sampling unit with reference to the " variance " or " error function " and the " cost function " in each particular zone.

As in the past, by arrangement with the Director-General of Commercial Intelligence and Statistics, the estimates of the cotton crop were received by wire and released in Bombay at a time previously fixed to synchronise with the time of their release in Calcutta.

3. COLLECTION OF STATISTICS OF COTTON IMPORTED INTO BOMBAY BY ROAD.

Reference was made in the last year's report to the proposed collection of the statistics of cotton imported into Bombay by road, through the agency of the Bombay Port Trust, the expenditure on this account to be borne by the Committee, the East India Cotton Association, the Bombay Chamber of Commerce and certain other interested parties. The proposal will be given effect to as soon as the necessary legislation, empowering the Bombay Port Trust with the required authority, is passed by the Government of Bombay.

4. STAPLE LENGTH OF THE INDIAN COTTON CROP.

A Report on the estimated production of cotton according to staple length for 1939-40 season was issued in May; the trade estimates of the crop were also presented in this report. Of the official estimate of 4,984,000 bales (compared with the trade estimate of 5,943,000 bales), 6% was of staple length 1" and above and 32% of staple length $\frac{7}{8}$" to 31/32".

5. REPORT ON THE ACCURACY OF THE ALL-INDIA COTTON FORECASTS.

The fourth issue of this Report, pertaining to the season 1938-39, was published in July. According to the report, the commercial crop of 1938-39 was estimated to be in the neighbourhood of 6,051,000 bales, whilst the figure forecasted in April 1939, was 5,120,000 bales. The forecast estimate was thus lower by 15 per cent on the basis of the actual crop as arrived at by the Committee. This was accounted for by the observed underestimation in the forecasts of the United Provinces, the Punjab, Sind, Bombay Province, Madras Province, Central India and Rajputana.

6. STATISTICS OF COTTON PRESSED.

Under the provisions of the Cotton Ginning and Pressing Factories Act, 1925, every cotton pressing factory in British India is required to submit, to the prescribed authority, weekly returns of the number of bales pressed in it. Indian States having pressing factories have also co-operated in enforcing the submission of similar returns by factories situtated within their limits. The all-India figures of cotton pressed are published weekly in the Indian Trade Journal. In addition to the figures in running bales, their equivalents in statistical bales of 400 lbs. net are compiled by the Director General of Commercial Intelligence and Statistics and published monthly in the same Journal.

The Committee expressed its concurrence with the suggestion of the East India Cotton Association that the statistics of cotton pressed should be compiled on the basis of the recognised trade descriptions as adopted in the revised trade classification* of Indian cottons. As this involved an amendment of the Cotton Ginning and Pressing Factories Rules framed by the Provincial Governments, the Government of India were addressed and they have referred the matter to the Provincial Governments for opinion.

During the season 1939-40, 3,603,860 bales of cotton were pressed in British India and 1,384,136 bales in Indian States, making a total of 4,987,996 bales for all-India; the corresponding figures for 1938-39 were 3,662,286 1,562,165 and 5,224,451 bales, respectively. For India as a whole, the average net weight per bale of cotton pressed during the season under report amounted to 392 lbs. which is the same as in the previous season.

7. UNPRESSED (LOOSE) COTTON STATISTICS.

The statistics of cotton pressed do not account for the whole of the Indian cotton crop as, apart from the quantity utilised for extra-factory consumption,

*Appendix III (page 135.)

chiefly in the form of *kapas*, mills situated in cotton growing areas often use considerable quantities of ginned, unpressed cotton. Prior to 1936-37, the relevant statistics relating to unpressed cotton were compiled on a voluntary basis but from 1936-37, they are being collected under statute by an amendment of the form of return submitted by mills under the Indian Cotton Cess Act, 1923. Similar information for Indian States is obtained on a voluntary basis through the courtesy of the Darbars concerned. During the year, 464,028 bales of unpressed cotton were consumed in mills in India against 458,119 bales during the preceding year. The relevant figures for 1926-27 to 1939-40 are given in Appendix IV to this report.

8. STATISTICS OF COTTON GINNED.

The question of instituting ginning returns on an all-India basis has been under the consideration of the Committee recently, as it was felt that such returns would, by supplementing the returns of cotton pressed, give a more complete indication of the cotton crop of the country. The figures of cotton pressed do not cover the entire crop as, apart from ginned unpressed cotton consumed in spinning mills for which figures are available, both ginned unpressed cotton and *kapas* are also utilised for domestic purposes, such as, hand-spinning, making of quilts, mattresses, etc., for which there are no reliable data. With the institution of ginning returns, however, all that would be necessary for arriving at the actual crop would be to estimate the quantity of *kapas* used for domestic purposes. The two returns would at the same time serve as checks on each other. The submission of ginning returns is already in force in the Central Provinces and Berar, while in the Bombay Province, the institution of such returns* for which provision exists in the Cotton Ginning and Pressing Factories (Bombay Amendment) Act, 1936, is under contemplation. In view of these considerations, it was decided that the various cotton growing provinces and States other than Bombay and the Central Provinces and Berar should be requested to take steps to amend the existing Cotton Ginning and Pressing Factories Act or other similar legislation in force, to provide for the monthly submission of returns of cotton ginned by ginning factories. The authorities concerned have been addressed accordingly.

9. INDIAN MILL CONSUMPTION.

Figures of consumption of Indian cotton in mills in British India and Indian States for the years 1925-26 to 1939-40, based on the monthly statements issued by the Committee, are given in Appendix IV. The total consumption

* Since instituted from September 1940.

of Indian cotton in mills in India during the season under report, *viz.*, 3,017,144 bales, showed a slight reduction as compared with the record figure of the previous season. It may, however, be mentioned in this connection that consumption in March and partly in April was affected by a prolonged strike in the mill industry in Bombay Island. As a result, consumption of Indian cotton in the Bombay Province decreased by 11% on the previous year. Mills in the Madras Province, Bengal and Punjab and Delhi, however, showed slightly increased activity as compared with the previous season. Consumption of Indian cotton in the Madras Province, which amounted to 507,085 bales, established another record during the season, the figure for the month of July 1940, *viz.*, 48,615 bales, being the highest recorded for the Province for any month. The monthly average in 1938-39 was 40,070 bales.

10. EXPORTS.

The exports of Indian cotton from British India during the season totalled 2,345,000 bales against 3,274,000 bales in 1938-39. On the average of the five financial years ending 1938-39, the value of cotton (including waste) exported from British India formed 41% of the total value of "Raw materials and produce and articles mainly unmanufactured" exported, and 20% of the total value of all merchandise exported.

11. STOCKS.

As in the past, mills, trade associations, market committees and other authorities gave valuable assistance in the collection of figures of stocks of cotton held in the country at the end of the season. Much ground, however, still remains to be covered before the statistics can be claimed to be complete. The information collected in respect of stocks held on the 31st August, 1940, is contained in Appendix V. Stocks of Indian cotton held in India at the end of the season 1939-40 increased by 165,000 bales over the previous year. Of the stocks of 1,037,000 bales held by the trade (excluding spinning mills) on August 31, 1940, against 803,000 bales on the corresponding date of the previous year, increases were recorded mainly under Americans, Oomras and Broach.

As the season adopted for the cotton crop of the Madras province is the year ending 31st January, figures of stocks held in the province on this date are collected annually in addition to the figures relating to the 31st August. The relevant figures for the 31st January, 1940, together with comparative details for previous years, are given in Appendix V.

12. DEMAND FOR VARIOUS TYPES OF INDIAN COTTON.

Statistics relating to internal and export demand for various types of Indian cotton are compiled in the Secretary's office from information furnished on a voluntary basis. These are of considerable value, not only to the trade and industry but also to those entrusted with the responsibility of shaping and directing the cotton policy of the country. The statistics collected for the year 1939-40 are contained in Statistical Leaflets Nos. 3* and 4† (1939-40).

Receipts at mills during the season were higher by 68,000 bales while exports were down by 957,000 bales, as compared with the previous season. Export demand for short staple varieties, particularly *Dholleras*, *Broach*, *Oomras*, *Central India* and *Comillas* showed a marked falling off, the total shrinkage in the exports of such cotton (below seven-eights of an inch in staple) being 758,000 bales against 199,000 bales under long and medium staple.

13. PERIODICAL REVIEWS OF THE STATE OF FOREIGN TRADE IN INDIAN COTTON.

By arrangement with the Director General of Commercial Intelligence and Statistics, a clerk is employed in his office, at the Committee's expense, with the object of furnishing monthly reviews on the state of foreign trade in Indian cotton. These reviews, besides giving information on the developments in the cotton situation in general, also contain statistics relating to Indian cotton based on the British Indian trade accounts as well as on the trade accounts of the importing countries. The reviews are supplied to trade bodies represented on the Committee and to cotton spinning mills on request; they are also available to the public at a small charge.

14. PUBLICATIONS.

The undermentioned statistical publications were issued during the year under report:—

(1) Final Report of the Bombay Cotton Forecast Improvement Scheme, 1934-39.

(2) *Statistical Leaflet No.* 2.—Sixth Issue (1938-39), "Stocks of Indian raw cotton held in India by the mills and the trade on 31st August, 1939."

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* Appendix VII (page 145.) † Appendix VI (page 144.)

(3) *Statistical Leaflet No.* 3.—Sixth Issue (1938-39), "Receipts at mills in India of raw cotton classified by varieties—1938-39 season."

(4) *Statistical Leaflet No.* 4.—Sixth Issue (1938-39), "Exports by sea of Indian raw cotton classified by varieties—1938-39 season."

(5) *Statistical Leaflet No.* 1.—Seventh Issue (1939-40), "Report on the staple length of the Indian cotton crop of 1939-40 season."

(6) *Statistical Leaflet No.* 5.—Fourth Issue (1938-39), "Report on the accuracy of the all-India cotton forecasts of 1938-39 season."

(7) *Statistical Bulletin No.* 9.—"Supply and distribution of the various types of Indian cotton during the season of 1938-39."

CHAPTER VI.

GENERAL.

I. IMPROVEMENT IN MARKETING.

Realising from the outset that improvement in the science and practice of agriculture must go hand in hand with improvement in the method of disposal of the produce, much attention has been devoted by the Committee to the improvement of primary cotton marketing. Regulated cotton markets existed in Berar before the establishment of the Indian Central Cotton Committee and that system which had stood the test of time was commended with certain modifications for general adoption. An investigation into the financing and marketing of cultivators' cotton was conducted by the Committee and this established beyond doubt that in those tracts where regulated markets exist the cultivators obtain better prices for their cotton. In view of this, Provincial Governments were requested to take steps for the establishment of regulated markets. As a result of this, legislation for the establishment of such markets has been enacted in Bombay and the Central Provinces, and in Madras the establishment of regulated cotton markets has been provided for under the Commercial Crops Markets Act. Hyderabad, Indore and some other Indian States have also passed similar legislation, and open markets have been established. The present position in this connection is indicated below.

With the passing of the Bombay Agricultural Produce Markets Act, 1939, the Bombay Cotton Markets Act, 1927, has now been repealed, but provision has been made in the new Act to recognise the regulated markets established under the Bombay Cotton Markets Act, 1927. After publication of the rules under the Act, the markets will be in a position to frame their own bye-laws. The three cotton markets established at Hubli, Gadag and Nargund mentioned in last year's report have not yet commenced to function.

In the Madras Province, Nandyal and Adoni Municipalities have been notified as markets for cotton under the Madras Commercial Crops Markets Act. The Tiruppur regulated cotton market, which has been in existence

since 1933, continued to function during the year. The desirability of opening cotton markets at other centres in the Coimbatore district is being examined by the Provincial Government.

In the Central Provinces, there were regulated cotton markets at Pulgaon, Wardha, Arvi, Hinganghat, Chanda, Warora and Katol. Proposals for the opening of regulated cotton markets at Khandwa, Burhanpur, and Bir in the Nimar district, and at Nagpur, Kamptee, Kondhali, Narkhed, Khapa, Kalmeshwar and Umrer are under the consideration of the Provincial Government, while enquiries have been instituted in respect of Pandhurna and Seoni-Chhapara markets.

In the Punjab, the Punjab Agricultural Produce Markets Act provides for the better regulation of the purchase and sale of, and the establishment of markets for, agricultural produce, including cotton. Rules under the Act, however, have not yet been framed.

Rules* under the Baroda Agricultural Produce Markets Act have been issued and made applicable to the Bodeli Market (Baroda District).

In the Hyderabad State, in addition to the 15 markets at Aurangabad, Jalna, Partur, Sailu, Hingoli, Nanded, Umri, Bhainsa, Nizamabad, Adilabad, Warangal, Khammam, Raichur, Badepalli and Latur, the Agricultural Produce Markets Act was extended during the year to six new centres, namely, Bidar, Bhongir, Dharmabad, Gulburga, Peddapalli and Purli. The Act is applicable to all important agricultural produce including cotton.

In Sangli State, a Huzur Order regulating the sale and purchase of commercial crops in the State continued to be in force.

In connection with the adoption of a definite cotton policy in Gujerat, one of the views expressed was that, as the crux of the whole problem centred round the better marketing of *1027 A.L.F.* cotton, the Agricultural Produce (Grading and Marking) Act should be utilised to enable this cotton to be marketed as a special grade of Surat cotton. The Government of India were accordingly requested to include cotton in the schedule to the Act to enable specified varieties of cotton to be protected under it, the intention being that once cotton is included in the schedule, specified varieties of cotton produced in specified areas could then be stamped with a special mark, the unauthorised use of which would be illegal under the Act. The recommendation was accepted by the Government of India, and *1027 A.L.F.* grown in certain tracts

* Appendix VIII (page 147).

in Gujerat (Bombay Province) is now being marketed under a special AG-MARK. The application of the rules to *289F-1* (*Sind Sudhar*) has also been approved by the Committee and the required draft of notification has been published by the Government of India.

In January 1938, the Indian Central Cotton Committee sanctioned a scheme for a cotton marketing survey in the Punjab, with the object of collecting all available information on the system of marketing cotton in the Province, so that, based on the data collected, suitable suggestions for improvement in marketing and for the establishment of regulated markets might be made. This scheme came into operation in September 1938, and terminated in February 1940. The survey included a detailed study of all the phases and channels through which cotton passes from the time it leaves the field to its final destination through the various intermediaries, and it also dealt with marketing practices in so far as they concern stocks and carry-over, the procedure in the ginning and pressing factories, baling and pressing charges and the despatch of cotton to various consuming centres. The report was duly considered by the Committee, and suitable action, wherever feasible, is being taken by the Provincial Government on the findings in the report. In accordance with the decision of the Committee, the work done under the scheme has also been brought to the notice of other Provincial Governments and the various States, and they have been requested to examine the desirability of undertaking similar surveys in suitable areas in their own provinces in consultation with the local marketing officers and interests concerned.

2. UNIVERSAL STANDARDS FOR INDIAN COTTONS IN INDIA.

Prior to 1933, standards for Indian cotton were prepared by the East India Cotton Association and the Karachi Cotton Association. The latter Association had standards for *Bengals*, Sind, Punjab-American and Sind-American cottons, whilst the former had standards for these as well as other varieties. As, however, the standards prepared by these two Associations in respect of the same varieties of cotton were different and resulted in a certain amount of competition between the two markets, the position was considered to be detrimental to the interests of the cotton grower. It was, therefore, decided that the Committee should consider in co-operation with the two Associations concerned, the question of adopting standards which would be of universal application in India. The two Associations were accordingly approached in the matter, and with their co-operation for the first time in 1934 standards common to the Bombay and Karachi markets were prepared by a Special Sub-Committee of the Indian Central Cotton Committee known

as the Standards Sub-Committee. The preparation of these standards has now become an annual feature in the activities of the Committee. During the year, universal standards for the following varieties of cotton were prepared :—

1. *Bengals,*
2. Sind,
3. Punjab-American,
4. Sind-American,
5. *Oomras.*
6. *Mathias,*
7. Broach,
8. *Dholleras,*
9. *Kumptas,*
10. *4-F* Saw Ginned Punjab,
11. *289F* Roller Ginned Punjab,
12. *289-F* Roller Ginned Sind,
13. *289F* Saw Ginned Punjab,
14. *289-F* Saw Ginned Sind.

The Karachi Cotton Association have adopted the universal standards of the Committee as the basis for their own standards and it has been recommended to the East India Cotton Association that trading in the Bombay market should be transacted on the basis of the universal standards of the Committee.

The Standards Sub-Committee while passing the universal standards for Berars and Broach for the 1938-39 season also compared the standards of the Liverpool Cotton Association for those cottons and expressed the view that the Liverpool standards were much inferior to and not at all representative of the actual growth of Berars and Broach. The matter was accordingly taken up with the Liverpool Cotton Association and arrangements were made to supply them with copies of sets of standards used by the respective Associations in India ; universal standards of the 1939-40 season of Broach and *Oomras* cottons were supplied by the East India Cotton Association and those of *Bengals,* Sind, Saw-ginned Punjab-American and Roller-ginned Punjab-American by the Karachi Cotton Association.

3. LEGISLATION.

In order to check the spread of undesirable or inferior types of cotton and insect pests and diseases and other malpractices, several legislative measures have been passed by the Central and Provincial Governments on the recommendation of the Indian Central Cotton Committee. A brief description of these is given below.

(l) **Cotton Ginning and Pressing Factories Act.**—The Cotton Ginning and Pressing Factories Act, 1925, applies to the whole of British India and practically all cotton growing Indian States have passed similar legislation. This Act requires every bale of cotton to be stamped with a special mark showing where it was pressed ; the Act also regulates certain matters connected with the management of cotton ginning and pressing factories and makes compulsory the submission by pressing factories of weekly returns of cotton pressed. Modifications in the rules have been called for from time to time, but the working of the Act has undoubtedly been a salutary check on malpractices. The Act, as amended by the Provinces of Bombay and the Central Provinces and Berar, prohibits watering, mixing and admixture of cotton and makes it obligatory on all cotton ginning and pressing factories situated in areas to which the Act is applied to obtain licences for their working. The question of enforcing the provisions of the Cotton Ginning and Pressing Factories (Bombay Amendment) Act in the Province of Sind is under the consideration of that Provincial Government. The enactment of similar legislation in the Provinces of Madras and the Punjab is under contemplation.

The Bill to further amend the Central Provinces Cotton Ginning and Pressing Factories Act to give effect to the recommendations of the Pools Committee appointed by the Provincial Government to examine the question of the effect of pools on ginning and pressing charges became law* during the year. The rules† framed by the Provincial Government under the Act were considered by the Committee and the attention of the Provincial Government was drawn to the absence of any provision in the rules in respect of the recommendations of the Committee regarding the restriction on the erection of new factories and the establishment of an appellate authority to whom appeals and revisions against the orders of the Rates Fixing Committee would be referred.

During the year under report, a complaint was received from the Manchester Cotton Association, Ltd., regarding illegible marks on bales shipped from Bombay, and this was brought to the notice of the shippers concerned. It was at the same time suggested to the Association that the spinners concerned should make their complaints direct to the suppliers whenever difficulty was experienced in reading the marks on bales imported from India. It was further pointed out that, to enable the Committee to follow up the matter in any particular case, identification marks and other details relating to the bales in question should invariably be furnished. As stated in the last year's report, a case pertaining to indecipherable press marks filed against a

* Appendix IX (page 159). † Appendix X (page 161).

factory was withdrawn on the advice of the Assistant Public Prosecutor, Ahmedabad, on the ground that the evidence of the then Secretary of the Committee who made the report was not recorded and that unnecessary expense and trouble would be involved in proceeding with the prosecution in the absence of conclusive evidence. On enquiry as to the nature of the evidence required to secure conviction, the Assistant Public Prosecutor expressed the opinion that the best evidence would have been the production of the hoops themselves or their photos coupled with the evidence of the seller, the survey clerk and one of the arbitrators of the East India Cotton Association. This opinion was forwarded to the East India Cotton Association which pointed out that if the special mark and the serial number were stencilled on the hessian only, as was permissible under the rules, it would not be possible to remove the hessian and preserve it. The suggestion that photos should be taken was also not considered feasible by the Association. It accordingly proposed that the Government of India should be requested to amend the Cotton Ginning and Pressing Factories Act, 1925, so as to make it legal for a duly certified arbitration award of a regularly constituted trading association to be used in Court as evidence in prosecutions under Section 4 of the Act, without the necessity for the appearance in Court of the arbitrators who made the award. The Government of India were accordingly addressed, but they could not see their way to amend the Act as suggested. In recording the reply of the Government of India the Committee decided that the Association should be requested to continue to depute a reliable witness other than the arbitrators to be present at the time when the arbitrators were examining the bales under dispute, so that his evidence would be available, if at any time required.

Out of 70 Indian States which have enforced in their territories the main provisions of the Cotton Ginning and Pressing Factories Act as applied to British India, by legislation or executive orders, weekly returns of cotton pressed were received from 61 ; in the remaining 9 States, pressing factories did not work during the year.

Complaints regarding the presence of foreign matter in Indian cotton were received from the Manchester Cotton Association, Ltd., and the International Federation of Master Cotton Spinners and Manufacturers' Associations, but as no particulars were supplied, these bodies were informed that, when lodging complaints, the press marks and the running numbers of the bales in question should be sent so as to enable the matter to be investigated. The Federation subsequently intimated that the complaints made were about East Indian Cottons in general and did not refer to any par-

ticular case. This reply was considered by the Committee and the Federation was informed that while the Indian Central Cotton Committee was only too anxious to investigate complaints of this nature against Indian cotton, it was most difficult to pursue the matter and take effective action unless full particulars and running numbers of the bales complained of were known. It was pointed out also that the Committee had received no complaints of the kind from any other source.

Complaints regarding watering of cotton in Broach forwarded by the East India Cotton Association were brought to the notice of the authorities who instructed the staff concerned to record cases and submit quarterly reports of inspection of the factories in respect of which complaints were made. In the Punjab, an accused prosecuted under Section 9(3) of the Act relating to structural requirements of factories was discharged owing to the lack of reliable evidence. Of the two cases reported in previous years which were proceeded with under Section 9(4)(*b*) of the Act, in one the owners were fined and in the other further proceedings were withdrawn as the owners reduced the number of gins to four. In one case instituted under Section 3(5) (*a*) and (*c*) of the Act in respect of the maintenance of registers, the owners were fined Rs. 20 each.

(ii) **Prevention of introduction of Foreign Cotton Pests**—In order to prevent the introduction into India of the Mexican Boll-weevil (*Anthonomus grandis*) with imported American cotton, at the instance of the Committee, regulations have been imposed by the Government of India under which the import of American cotton into India is prohibited except through the port of Bombay where it must be fumigated with hydrocyanic acid gas before entry into the country. The work of fumigation is carried out under the technical supervision of the Secretary, and the cost involved is met by the levy of a small fee from importers on each bale of American cotton fumigated. The imports of American cotton during the year under review amounted to 83,140 bales against 2,861 bales in the preceding year. A rebate of fumigation fees at the rate of five annas per square bale and three annas per round bale on all American cotton fumigated during the year ending 31st March, 1940, was granted by the Government of India on the recommendation of the Committee and paid to the importers.

The Red (Sudan) Bollworm (Diparopsis castanea) and other pests.—The restriction on the import of foreign *kapas* (unginned cotton) and of foreign cotton seed remained in force throughout the year. Sixty-four parcels of foreign cotton seed were received during the year, examined and fumigated, where necessary.

(iii) **Madras Cotton Control Act.**—This Act, which came into force in 1932, prohibits the cultivation and mixing of the short staple *neglectum* cotton, locally known as *pulichai*, in the long staple cotton growing tracts producing *Tinnevellies*, *Karungannies* and *Cambodias*. It is reported that no breach of the Act was committed in the Coimbatore district. A few stray plants of *pulichai* cotton were, however, noticed in the Madura district (Tirumangalam Taluk) but these were promptly removed. The cultivation of *pulichai* cotton, however, was on the increase in the Tinnevelly district; the number of prosecutions launched against the cultivators totalled 240 and the fines levied amounted to Rs. 1,213. Sixty-nine cases were still pending in the courts at the close of the year.

(iv) **Bombay Cotton Control Act.**—To check the spread of *Goghari*, a short staple high ginning *herbaceum* cotton, which threatened to invade the long staple cotton areas in Gujerat, the Bombay Government passed the Bombay Cotton Control Act in 1935 under which the cultivation, mixing or possession of *Goghari* in specified areas is a penal offence. As a result of the introduction of the Act and vigorous propaganda by the Agricultural Department, *Goghari* has completely disappeared from the areas where it was at one time extensively grown. During the year under review, the Act is reported to have worked satisfactorily in the area south of the Narbada. There is, however, the potential danger of the spread of another variety inferior to *1027 A.L.F., viz., Selection 1A*, in parts of the Surat district where *Goghari* was formerly grown, and, if the extension of this cotton is to be controlled, the Act would require to be so amended as to empower the Provincial Government to prohibit the cultivation and handling of any specified type or types of cotton the spread of which the Provincial Government may desire to restrict. For this purpose the Provincial Government have drafted a bill to replace the existing Bombay Cotton Control Act.

(v) **Central Provinces Cotton Control Act.**—This Act, which was passed into law towards the end of 1936, has for its object the elimination, from the Central Provinces and Berar, of Garrow Hill cotton, a very inferior, coarse but prolific variety, which threatens to mar the reputation of the Central Provinces cotton and thus to nullify the efforts of the Agricultural Department in the matter of cotton improvement. The Act has been applied for a period of five years to the districts of Nagpur, Wardha, Amraoti, Yeotmal, Buldhana, Akola and Nimar and Sansar *tehsil* of Chhindwara district. The application of the Act late in the 1938 season gave little time to the Department of Agriculture to carry on propaganda among the cultivators with the result that the area under Garrow Hill cotton during the season was not much affected. From the

beginning of 1939, however, systematic propaganda has been carried out by the Department and the area under *V. 434* has considerably increased. During the year it was noticed that the cultivation of Garrow Hill cotton was still carried on in certain areas and measures for ensuring more satisfactory control are under the consideration of the authorities concerned.

(vi) **Baroda Cotton Control Act.**—The Bombay Cotton Control Act of 1935 has, by a notification of the Baroda State, dated the 25th April, 1936, been applied to the State with certain modifications to meet its own requirements. This Act prohibits the cultivation of *Goghari* cotton in the Navsari District of the State. Subsequent observations have shown that the presence of this cotton, even in field sowings, was very small, thus proving that the introduction of this Act has achieved its purpose.

(vii) **Bhopal Cotton Control Act.**—The Bhopal Cotton Control Act, which was enacted in April 1937, aims at promoting the cultivation of superior cottons and prohibiting the growing of inferior cottons in the Bhopal State. The State Department of Agriculture is working out a scheme to ensure an adequate supply of pure seed. However, since the preliminary work has not yet been completed, the Act has not come into operation.

(viii) **United Provinces Cotton Pest Control Act.**—As reported last year, this Act has been passed into law and rules have been framed under it. However, the final publication of the rules has been postponed for the time being.

(ix) **Cotton Transport Act.**—The clean-up measures described above may be considered as being largely supplementary to the Cotton Transport Act which was passed by the Central Government in 1923 at the instance of the Indian Central Cotton Committee. This Act enables Provincial Governments to prohibit the import of cotton, *kapas* or seed into specified areas from outside unless required for a special purpose and covered by a licence. Under this Act, protected areas have been notified in the provinces of Bombay, Madras and the Central Provinces and Berar as also in the States of Hyderabad, Baroda, Indore, Gwalior, Rajpipla, Sangli, Chhota Udepur, Lunawada, Bhaderwa, Kadana, Sant, Sanjeli, Jambughoda and Baria. A brief account of the working of the Act in the Provinces and States is given below.

Bombay.—The protected areas in the Bombay province remained unchanged. In the tract south of the Narbada, where the Act was put into operation in May 1939, half pressed bales from Olpad were permitted to be transported under licence to Surat for full pressing under departmental supervision and were duly marked "Olpad." The total number of bales thus marked was

20,172 (F.P.). Licences were also granted for the transport of cotton from some villages in Ankleshwar *Taluka* for sale to gins in Olpad. The Bombay Government have issued a notification which permits cotton from protected areas in Baroda States to be imported into the corresponding protected areas of Bombay Province without a licence.

In the Karnatak tracts, application of the Act was very effective in the case of imports by rail. To prevent illicit imports by road, check stations were opened on the main roads on the borders of protected areas. During the year under report, there were 20 temporary and 6 permanent check stations.

Madras.—The Act worked smoothly and there was no change in the protected areas.

Central Provinces.—The protected areas in the Central Provinces and Berar remained unchanged in the year under review.

The protected areas in the Hyderabad, Baroda, Indore, Rajpipla, Sangli, Chhota Udepur, Baria, Lunawada, Bhadarwa, Kadana, Sant, Sanjeli and Jambughoda States remained unchanged during the year.

Gwalior State.—There was no change in the protected areas. Certain island tracts *viz.*, Gangapore, Bhesoda, Nikumbh, Mandafia, etc., except Neemuch and Jawad, were excluded from the protected areas to enable the gin-owners in those localities to import cotton from outside in order to keep their gins working.

4. COLLECTION AND SUPPLY OF INFORMATION.

As usual, notes on the progress in the introduction of improved varieties of cotton in the provinces and Indian States and on the work of the Committee were supplied to the East India Cotton Association and the Karachi Cotton Association for publication. The weekly statements of purchases and arrivals of American cotton were published for general information. The names of pressing factories in Indian States with the requisite details regarding press marks, name of owner or occupier, etc., were communicated to the Director General of Commercial Intelligence and Statistics, Calcutta, for publication in the Indian Trade Journal and for incorporation in the all-India list of cotton ginning and pressing factories published by that Department.

Press notes and leaflets describing the various activities of the Committee and other matters of interest to the cotton industry in general were issued from time to time, during the year.

5. PUBLICATIONS.

Several important scientific and technical journals are received by the Committee, partly by subscription and partly on an exchange basis. These are circulated among its research workers who are thereby enabled to keep in touch with the latest scientific literature which otherwise would not ordinarily be accessible to them.

The Committee desires to express its indebtedness to those institutions which have placed its name on their free mailing lists, in particular to the British Cotton Industry Research Association for its Summary of Current Literature and the Shirley Institute Memoirs, and to the Empire Cotton Growing Corporation, the British Cotton Growing Association and the East India Cotton Association and the Karachi Cotton Association, for the supply of their publications. The Committee also records its thanks to the Indian Trade Commissioner, London, the U.S.A. Department of Agriculture, the U.S.A. Agricultural Experiment Stations, the Lingnan University, Canton, China, the Mitsubishi Economic Research Bureau, Tokio, Japan, the Egyptian Ministry of Agriculture, Technical and Scientific Service, the Liverpool Cotton Association, the Imperial Agricultural Bureau, London, the Imperial Bureau of Plant Genetics, Cambridge, the Manchester Cotton Association, the Textile Institute, Manchester, the Imperial Institute, London, the Indian Statistical Institute, the National Institute of Sciences, Calcutta, and other Associations and Chambers of Commerce for supplying the Committee with their reports, statistics and other valuable literature from time to time.

6. RESEARCH STUDENTS.

In the beginning, the Committee had perforce to undertake the training of research workers in the various branches of science pertaining to cotton for employment on its research schemes. Gradually, however, the necessity for this has disappeared, and scholarships are now, generally speaking, only granted whenever need arises for research workers with specialised training in a particular branch of science to meet the requirements of one or other of the Committee's schemes. Distinguished graduates are selected and placed for training under experienced research workers either on the Committee's schemes in the provinces, at the Institute of Plant Industry, Indore, at the Committee's Technological Laboratory or under professors in Indian Universities. Sometimes scholarships are also awarded for specialised training at recognised institutions abroad. The term of scholarship is usually two years, but extensions are sometimes sanctioned if found necessary.

Scholarships are awarded under two categories, *viz.*, training grants and general scholarships. The former are intended for Government servants who are recommended by provincial Governments and for employees of the Committee who are considered suitable. General scholarships are awarded to University Graduates who are selected by the Research Students Selection Sub-Committee. Applications for this class of scholarships are invited by advertisement.

Fifty-four scholarships and nine training grants have been awarded so far ; out of these, one scholarship and six training grants were for students abroad. During the year under report, one research student was under training in England.

Expenditure on research studentships up to the 31st August, 1940, amounted to Rs. 2,78,979.

D. N. MAHTA,

Secretary.

APPENDIX I.

MEMBERS OF THE COMMITTEE.

(1) PRESIDENT—

Mr. P. M. Kharegat, C.I.E., I.C.S., Vice-Chairman, Imperial Council of Agricultural Research, *ex-officio*.

(*a*) Dr. W. Burns, C.I.E., Agricultural Commissioner with the Government of India, *ex-officio*.

(2) REPRESENTATIVES OF AGRICULTURAL DEPARTMENTS—

Madras	Mr. A. R. C. Westlake, I.C.S., Director of Agriculture.
Bombay	The Director of Agriculture.
United Provinces	Mr. Vishnu Sahay, I.C.S., Director of Agriculture.
Punjab	The Director of Agriculture.
Central Provinces and Berar	Mr. J. C. McDougall, I.A.S., Director of Agriculture.
Sind	Rao Saheb K. I. Thadani, Director of Agriculture.

(3) THE DIRECTOR GENERAL OF COMMERCIAL INTELLIGENCE AND STATISTICS, *ex-officio*.

(4) REPRESENTATIVES OF CHAMBERS OF COMMERCE AND ASSOCIATIONS—

The East India Cotton Association	Sir Purshotamdas Thakurdas;; C.I.E., M.B.E.
The Bombay Millowners' Association	Mr. S. D. Saklatvala, M.L.A.
The Bombay Chamber of Commerce	Mr. L. F. H. Goodwin.
The Indian Merchants' Chamber	Mr. Chunilal B. Mehta.
The Karachi Chamber of Commerce	Mr. A. P. Darlow.
The Ahmedabad Millowners' Association	Mr. Chandulal P. Parikh.
The Tuticorin Chamber of Commerce	Mr. J. Vonesch.
The Upper India Chamber of Commerce	Captain S. R. Pecock, M.C., M.L.A.
The Empire Cotton Growing Corporation	Sir William Roberts, C.I.E.

(5) COMMERCIAL REPRESENTATIVES NOMINATED BY CENTRAL GOVERNMENT—

Central Provinces and Berar	Rao Saheb P. V. Deshmukh, Mr. Y. G. Deshpande.
Madras	Mr. J. M. Doak.
Punjab	Kanwar Raj Nath.
Bengal representative	Mr. Girija Prosanna Chakraverty.

(7) CO-OPERATIVE BANKING REPRESENTATIVE—

Sir Chunilal V. Mehta, K.C.S.I., (*Vice-President*).

(8) REPRESENTATIVES OF COTTON GROWING INDUSTRY—

Madras	Rao Bahadur R. V. Ramasundaram Pillai, Mr. H. Sitarama Reddy.

Bombay	Mr. Yashwantram Rajaram Joshi, Mr. Mangesh Babhuta Patel, M.L.A.
United Provinces	Chaudhari Shivamangal Singh, M.L.A., Rai Bahadur Kunwar Laxmi Raj Singh, M.L.C.
Punjab	Sardar Bahadur Gurbachan Singh, M.L.A., Ch. Mohammad Yasin Khan, M.L.A.
Central Provinces and Berar	Rao Bahadur Sir Madhaorao Deshpande, K.B.E., Mr. Suganchand Tapadia.
Sind	Mr. Roger Thomas.

(9) AND (10) REPRESENTATIVES OF INDIAN STATES—

Hyderabad State	Mr. Nizam-ud Din Hyder, Director of Agriculture.
Baroda State	Mr. R. G. Allan, C.I.E., Commissioner of Agriculture.
Gwalior State	Lt. Sardar D. K. Jadhav, Director of Agriculture.
Rajputana and Central India States ..	Mr. T. R. Low, I.A.S.

(11) ADDITIONAL MEMBERS NOMINATED BY THE GOVERNOR-GENERAL IN COUNCIL :—

1. Rao Bahadur S. S. Salimath, Deputy Director of Agriculture, Southern Division, Dharwar.
2. Mr. T. G. Rama Iyer, Director of Agriculture in Mysore, Bangalore.
3. Rao Bahadur V. Ramanatha Ayyar Avl., Cotton Specialist, Coimbatore.
4. Rai Bahadur S. V. Kanungo, Revenue Minister, Holkar State, Representative of the Holkar State.
5. Dr. Chellaram Shewaram, Representative of the Karachi Indian Merchants' Association.
6. Dr. B. L. Sethi, Economic Botanist (Cotton & Rabi Cereals) to the Government of the United Provinces, Cawnpore.
7. The Hon'ble Mr. V. Ramadas Pantulu, President, Madras Provincial Co-operative Bank, Madras.
8. Lala Shri Ram, Representative of the Cotton Millowners of Delhi.
9. Mr. Jivandas Ladhabhai, Representative of the Karachi Cotton Association, Ltd.
10. Dewan Bahadur Sir T. Vijayaraghavacharya, K.B.E.
11. Sardar Rao Bahadur Bhimbhai R. Naik, Sagrampura, Surat.
12. Dr. T. E. Gregory, Economic Adviser to the Government of India.

APPENDIX II.

BALANCE SHEET AS AT 31ST MARCH, 1940.

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Cotton Cess Receipts	1,33,57,952 14 0		I. A. Administration		19,51,632 5 3
Less : Refunds of cess to Burma	42,369 10 9				
		1,33,15,583 3 3	B. *Improvement of Cotton Marketing.*		
Interest account :—					
Amount received on investments	20,29,531 9 5		1. Cost of exhibits, travelling allowance of representatives on the Board of East India Cotton Association and members of Standards Sub-Committee and cost of Standards	1,43,718 15 10	
Add—Refund of income-tax from interest ..	21,078 12 0				
	20,50,610 5 5		2. Enquiry into cost of cotton production in India	2,71,108 14 9	
Less :—					4,14,827 14 7
1. Interest paid in advance at the time of purchasing Govt. Papers (since recovered), interest on temporary overdrafts and Bank's commission for collection of interest	59,312 3 3		C. *Seed Distribution and Extension Schemes :—*		
2. Interest credited to Provident Fund Account	4,886 6 2				
3. Bank's withdrawal charges	5,279 8 0				
4. Income-tax on interest on Govt. Paper..	23,887 10 2		(i) *Bombay Presidency :—*		
5. Brokerage for securities sold	828 10 0		(1) Hubli..	44,048 8 3	
6. Provision for Sinking Fund	12,821 11 0		(2) Gadag	41,700 15 1	
			(3) Gadag (Supplementary) ..	20,167 11 4	
	1,07,016 0 7	19,43,594 4 10	(4) Surat	74,915 14 10	
			(5) Athani	18,086 1 7	
Profit on conversion and sale of securities ..		3,82,907 12 2	(6) Khandesh (Banilla).. ..	1,61,863 5 6	
			(7) Khandesh (Jarilla)	37,504 6 6	
Sinking Fund Account		12,821 11 0	(8) Deccan Canals (Banilla) ..	2,859 3 4	
			(9) B. D. 8	17,152 3 0	
Miscellaneous Receipts		72,199 5 4	(10) Revised Jayawant	1,02,576 12 4	
			(11) Gadag No. 1..	32,661 14 9	
Refund from Provident Fund for contributions disallowed		3,301 1 11	(12) Maintenance of nucleus of pure seed of improved varieties of cotton	5,645 6 9	
			(13) Scheme for control of Selection 1A.	404 0 0	
Suspense Receipts		362 7 9			
Carried over ..		1,57,30,859 14 3	Carried over ..	5,59,586 7 3	23,66,460 3 10

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Brought forward		1,57,30,859 14 3	Brought forward	5,59,586 7 3	23,66,460 3 10
			(*ii*) *Madras* :—		
			(1) Pay and allowance of Business Manager, Tiruppur	24,079 13 0	
			(2) Co.2	41,286 3 3	
			(3) H.1	3,952 2 9	
			(4) Maintenance of nucleus of pure seed of improved varieties of cotton ..	1,153 5 3	
			(*iii*) *Sind* :—		
			(1) Seed Distribution	3,79,613 2 9	
			(2) Maintenance of nucleus of pure seed of improved varieties of cotton	5,000 0 0	
			(*iv*) *Hyderabad* :—	48,346 5 3	
			(*v*) *Central Provinces* :—		
			(1) Extension of long staple cotton and Marketing of Verum Cotton	2,76,802 10 7	
			(2) Distribution and Marketing of Buri 107 cotton ..	5,698 0 0	
			(3) Maintenance of nucleus of pure seed of improved varieties of cotton	1,400 0 0	
			(*vi*) *Baroda* :—		
			(1) Navsari Storage	18,821 11 7	
			(2) B. D. 8	2,699 0 0	
			(*vii*) Lyallpur (Ginnery)	16,038 3 3	
			(*viii*) United Provinces C.402 ..	18,617 7 6	
					14,03,094 8 5
			D. *Printing and Propaganda* :—		
			(1) Publicity & Propaganda ..	1,56,555 15 0	
			(2) Printing & Distribution ..	88,087 14 9	
					2,44,643 13 9
Carried over		1,57,30,859 14 3	Carried over		40,14,198 10 0

BALANCE SHEET AS AT 31ST MARCH, 1940—(*contd.*)

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Brought forward		1,57,30,859 14 3	Brought forward		40,14,198 10 0
			E. *Statistical Research* :—		
			(1) Studies of Village consumption of Indian Cotton	24,277 5 2	
			(2) Improvement of Cotton Forecasts	30,772 9 0	
					55,049 14 2
			F. *Travelling Allowance* :—		
			Non-official members		2,22,220 10 9
			II. *Technological Research* :—		
			(1) A. *Technological Laboratory (Capital Expenditure)* :—		
			(1) Land & Buildings	4,07,988 14 6	
			(2) Machinery	1,19,522 1 2	
			(3) Freight	7,502 2 8	
			(4) Apparatus & Equipment ..	41,558 3 7	
			(5) Machinery & Workshop ..	5,789 8 3	
			B. *Working Expenses* —	23,45,878 15 1	
			(2) Provincial	1,57,636 5 9	
			(3) Development of alternative uses for Indian cottons	23,210 0 2	
					31,09,086 3 2
			III. *Research Studentships*	2,79,744 3 9	
			Less—Refund from Mr. Taskhir Ahmad	1,742 0 0	
					2,78,002 3 9
			IV. AGRICULTURAL RESEARCH GRANTS.		
			Bombay :—		
			1. A. Surat Physiological	2,45,139 11 3	
			B. ,, ,, Writing-up	5,814 7 8	
			2. A. Surat Bollworm	1,14,509 9 7	
			B. ,, ,, Propaganda ..	91,468 9 2	
			C. ,, ,, Writing-up ..	2,315 3 0	
			3. A. Dharwar Wilt	1,82,836 4 11	
			B. ,, ,, Writing-up ..	10,902 10 3	
Carried over		1,57,30,859 14 3	Carried over ..	6,52,986 7 10	76,78,557 9 10

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Brought forward		1,57,30,859 14 3	Brought forward	6,52,986 7 10	76,78,557 9 10
			4. Khandesh	26,573 5 0	
			5. Co-ordination of Cotton Research	1,749 7 6	
			6. Jalgaon Cotton Breeding ..	56,867 2 9	
			7. Broach Cotton Breeding ..	74,458 4 11	
			8. Small Leaf Disease Survey ..	3,938 9 6	
			9. Survey of Goghari Cotton ..	4,199 5 0	
			10. Defibration of Cotton Seeds ..	4,878 5 9	
			11. Plant Puller Propaganda ..	17,792 8 9	
			12. Breeding of Wilt Resistant Cotton for Surat Area	6,859 11 0	
			13. Inclusion of Northerns and Westerns at Bijapur	5,059 7 6	
			14. Poona Wilt Breeding	23,919 8 0	
			15. Extra Clerk for Bombay Schemes	4,982 0 0	
			16. Interspecific Hybridization at Surat	3,960 8 0	
			Total ..	8,88,224 11 6	
			V. *Madras* :—		
			1. Herbaceum	1,42,466 13 1	
			2. Pempheres and Physiological ..	1,75,245 9 11	
			3. Fodder Cholam	19,517 9 4	
			4. Breeding of Nadam Cotton ..	15,190 5 1	
			5. Improvement of Mungari Cotton	11,086 14 10	
			6. Investigation of the possibilities for control of cotton stem weevil ..	2,400 0 0	
			7. Improvement of Cocanadas ..	727 0 0	
			Total ..	3,66,634 4 3	
			VI. *Punjab* :—		
			(*a*) Botanical	5,71,287 3 8	
			(*b*) Entomological	2,25,908 7 11	
			(*c*) White Fly	48,721 4 1	
			(*d*) Root Rot	58,514 6 8	
			(*e*) Spraying Trials	10,191 13 6	
			(*f*) Defibrating and Delinting ..	6,112 8 9	
Carried over		1,57,30,859 14 3	Carried over ..	9,20,735 12 7	76,78,557 9 10

BALANCE SHEET AS AT 31ST MARCH, 1940—(*contd.*)

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Brought forward		1,57,30,859 14 3	Brought forward	9,20,735 12 7	76,78,557 9 10
			(*g*) Survey of Disease of Malformation	1,730 10 6	
			(*h*) Physiological	2,26,169 12 1	
			(*i*) Clean-up Campaign of Spotted Bollworm	58,088 15 0	
			(*j*) Jassid Investigation	8,930 8 3	
			(*k*) Improvement of Punjab American	4,759 2 0	
			.. .. Total ..	12,20,414 12 5	
			VII. *Central Provinces.*—		
			(*a*) Botancial	5,04,122 13 4	
			(*b*) Entomological	12,344 13 6	
			(*c*) Investigation of Heliothis Obsoleta	959 0 0	
			Total ..	5,17,426 10 10	
			VIII. *United Provinces.*—		
			(*a*) Pink Bollworm	1,46,834 1 4	
			(*b*) Rohilkhand & Bundelkhand Survey	18,382 10 4	
			(*c*) Botanical	26,111 3 3	
			.. .. Total ..	1,91,327 14 11	
			IX. Institute of Plant Industry, Indore ..	18,66,943 12 0	
			X. *Sind.*—		
			(*a*) Physiological	2,63,945 12 10	
			(*b*) Jassid Investigation	5,500 12 1	
			(*c*) Black Headed Cricket	5,680 10 8	
			(*d*) Scheme for production of long staple cottons	817 2 3	
			Total ..	2,75,944 5 10	
			XI. *Burma.*—		
			(*a*) Capital Expenditure	2,906 15 5	
			(*b*) Cotton Improvement	47,790 3 9	
			Total ..	50,697 3 2	
Carried over		1,57,30,859 14 3	Carried over ..	53,77,613 10 11	76,78,557 9 10

BALANCE SHEET AS AT 31ST MARCH, 1940—(*contd.*)

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs a. p.	Rs. a. p.
Brought forward		1,57,30,859 14 3	Brought forward	53,77,613 10 11	76,78,557 9 10
			XII. *Hyderabad.*—		
			(*a*) Botanical	3,42,033 3 8	
			(*b*) Cotton Survey	36,578 3 0	
			(*c*) Pink and Spotted Bollworm ..	81,995 1 10	
			(*d*) Improvement of Kumpta cotton ..	14,011 15 7	
			(*e*) Inclusion of Northerns and Westerns in Dry Farming Scheme at Raichur	1,095 0 0	
			(*f*) Pink and Spotted Bollworm Clean-up Campaign	38,471 0 0	
			Total ..	5,14,184 8 1	
			XIII. Bikaner Bengals	57,199 5 2	
			XIV. *Baroda.*—		
			(*a*) Root Rot	76,787 14 7	
			(*b*) Comparative Tests	4,251 5 3	
			(*c*) Survey of Goghari Cotton	3,472 7 0	
			(*d*) Plant Puller Propaganda	24,088 7 9	
			Total ..	1,08,600 2 7	
			XV. Bengal Comilla	24,658 12 9	
			XVI. Mysore Doddahathi	11,050 3 0	
			XVII. Collection of Iran Cottons	3,144 3 0	
			XVIII. *Improvement of Dholleras Cotton.*—		
			(*a*) Wagad Cottons at Viramgam ..	14,196 11 5	
			(*b*) Mathio Cotton at Amreli and Jagudan	9,764 0 4	
			XIX. Preliminary Scheme at Nawanagar ..	323 12 4	
			XX. Estimation of effects on cotton crop of the use of Plant Puller	4,143 12 5	
Carried over		1,57,30,859 14 3	Carried over ..	61,24,879 2 0	

BALANCE SHEET AS AT 31ST MARCH, 1940—(*concld.*)

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Brought forward		1,57,30,859 14 3	Brought forward	61,24,879 2 0	76,78,557 9 10
			XXI. (*a*) Punjab Cotton Marketing Survey	7,323 2 3	
			(*b*) Baroda Better Marketing of 1027 A.L.F.	3,612 14 10	
					61,35,815 3 1
			XII. *Loan Recoverable but considered doubtful:*—		
			Hubli Co-operative Cotton Sale Society		6,353 2 0
			By Suspense account		5,860 0 8
			By Balance		19,04,273 14 8
GRAND TOTAL		1,57,30,859 14 3	GRAND TOTAL		1,57,30,859 14 3

PROVIDENT FUND ACCOUNT AS AT 31st MARCH, 1940.

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Subscribers' contribution account	3,42,406 13 10		By advance to Subscribers	56,353 15 0	
Less—Payment made to subscribers resigned ..	1,02,694 5 10		*Less*—Recoveries made upto 31st March, 1940..	52,413 10 0	
	3,34,363 1 5	2,39,712 8 0			3,940 5 0
Committee's contribution account			Accrued interest on Govt. paper upto 31-3-1940, credited to subscribers for distribution ..		5,167 14 10
Less—Payment made to subscribers resigned and forfeitures for Committee's contributions disallowed	99,134 15 1		By Balance		5,01,422 1 2
		2,35,228 2 4			
Suspense deposit of Mr. Dutt's own contribution		1,206 7 7			
Investment Fluctuation account		26,037 10 5			
Lapse and Forfeiture account		2,890 11 7			
Suspense Receipts for amount due to the subscribers resigned :—					
(1) Mr. W. R. Sahani 1,475 10 5					
(2) Mr. Luchmandas 641 1 2					
(3) Dr. S. S. Verma .. 3,338 1 6					
		5,454 13 1			
TOTAL ..		5,10,530 5 0	TOTAL ..		5,10,530 5 0

STATEMENT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 31ST MARCH, 1940.

RECEIPTS.	Rs. a. p.	Rs. a p..	EXPENDITURE.	Rs. a. p.	Rs. a. p.
*Opening Balance ..	18,96,923 4 8		Administration of the Committee (including Improvement of Cotton Marketing, Seed Distribution and Extension Schemes, Printing and Propaganda, Statistical Research and Travelling Allowance of Non-Official Members)		3,06,000 0 7
Less—Payments of Leave Pay to Staff for 1938-1939	100 5 0				
		18,96,822 15 8	Agricultural Research Grants-in-Aid (including Marketing Scheme) ..		3,92,719 2 10
Receipts under Section 12 of the Indian Cotton Cess Act, 1923 ..		6,99,974 0 9	Technological Research		2,09,386 7 3
**Other Receipts ..		1,46,238 15 5	Closing Balance :—		
			(Government Paper at Cost.)		
Interest on Invesments		81,556 12 2	*3½% Government of India Loan 1947-50 of the Face Value of Rs. 4,50,000	3,93,314 1 0	
			4½% Government of India Loan 1955-60 of the Face Value of Rs. 26,600	25,004 0 0	
*Includes Rs. 11,040-5-0 on account of Sinking Fund and Rs. 6,966-2-0 Loans Recoverable from Hubli Co-operative Cotton Sale Society.			5% Government of India Loan 1940-43 of the Face Value of Rs. 2,90,000	3,23,550 0 0	
			6% Bombay Municipal Bonds 1954 of the Face Value of Rs. 10,000	3,950 0 0	
**Includes Rs. 1,781-6-0 against provision for Sinking Fund for the year 1939-40, Rs. 1,500 received for Sales of one old Nasmith Comber Machine, Rs. 362-7-9 on account of Suspense Receipts, and Rs. 1,32,448-2-0 being net gain realised on Sales and Redemption of Securities ..			6% Rangoon Municipal Debentures 1955 of the Face Value of Rs. 3,83,500	4,15,328 2 0	
			4% Karachi Port Trust Bonds 1943 of the Face Value of Rs. 80,000	81,800 0 0	
				12,42,946 3 0	
			(Market Value on 31st March, 1940, Rs. 13,57,360-8-0)		
			India Treasury Bills of the Face Value of Rs. 5,75,000	5,72,304 11 0	
			Fixed Deposits with the Chartered Bank of India, Australia and China	84,000 0 0	
			Current Account with the Imperial Bank of India, Bombay	1,053 0 8	
			Imprests :—Committee's Account as certified by the Secretary, ... Rs. a. p. 1,500 0 0		
			Technological Research Laboratory as certified by the Director, Technological Laboratory 500 0 0		
			Director of Agriculture, Bombay Presidency, as certified by the Director of Agriculture, Bombay Presidency .. 790 0 0		
Carried over ..		28,24,592 12 0	Carried over ..	19,00,303 14 8	9,08,105 10 8

STATEMENT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 31ST MARCH, 1940—(*concld.*)

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Brought forward ..		28,24,592 12 0	Brought forward ..	19,00,303 14 8	9,08,105 10 8
			Registrar, Co-operative Societies, and Director of Rural Development, Bombay Province, Poona, as certified by the Registrar, Co-operative Societies .. .. Rs. a. p. 580 0 0		
			Director of Agriculture, Sind, as certified by the Director of Agriculture, Sind 350 0 0		
			Cotton Research Botanist, Lyallpur, as certified by the Cotton Research Botanist, Lyallpur 150 0 0		
			Plant Physiologist, Punjab, as certified by the Plant Physiologist, Punjab 100 0 0	3,970 0 0	
			Suspense (Recoverable)	5,860 0 8	
			Loan Recoverable (But considered Doubtful)	6,353 2 0	
			‡ Total Closing Balance		19,16,487 1 4
TOTAL ..		28,24,592 12 0	TOTAL ..		28,24,592 12 0

*3½% Government of India Loan 1947-50 of the Face Value of Rs. 1,50,000 have been deposited with the Imperial Bank of India, Bombay, as Security against any overdraft that may be required by the Committee .. ..

† Includes Rs. 12,821-11-0 on account of Sinking Fund.

We have examined the above Statement of Receipts and Payments of the Indian Central Cotton Committee with the Books, Vouchers and Certified Returns of the Committee, have obtained all the information and explanations we have required and certify that to the best of our information and explanations received, the above Statement is a correct abstract of the figures appearing in the Books and is drawn up in conformity with the Rules under the Indian Cotton Cess Act, 1923.

(Sd.) S. B. BILLIMORIA,
Registered Accountants, Auditors.

BOMBAY, *24th June* 1940.

PROVIDENT FUND ACCOUNT AS AT 31ST MARCH, 1940.

RECEIPTS.	Rs. a. p.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Opening Balance as on 1st April, 1939 ..	4,53,285 11 5			Balance—		
Less—Payments to subscribers who resigned in 1938-1939	2,012 8 11			(Securities in Government Papers at Market Value).		
		4,51,273 2 6		3½% Government Promissory Notes of the Face Value of Rs. 2,35,400	2,23,777 2 0	
Subscribers' Contributions	28,545 0 0			3½% Government of India Loan, 1947-50 of the Face Value of Rs. 1,20,000	1,25,250 0 0	
Add—Recoveries against Advances	4,750 6 0					
		33,304 6 0		4% Government of India Loan, 1960-70 of the Face Value of Rs. 32,600	35,269 2 0	
		4,84,577 8 6				
Less—Refunds to Subscribers who have resigned	15,488 13 2			2¾% Government of India Loan, 1948-52 of the Face Value of Rs. 70,000	67,987 8 0	
Advances to subscribers	5,084 13 0				4,52,283 12 0	
		20,573 10 2				
		4,64,003 14 4				
Committee's Contributions received from Indian Central Cotton Committee		28,545 0 0		Savings Bank Account with the Imperial Bank of India, Bombay	9,209 4 0	
		4,92,548 14 4		Current Account with the Imperial Bank of India, Bombay ..	39,929 1 2	
Less—Payments made to subscribers who have resigned, including transfers to 'Lapses and Forfeitures' Account for contributions disallowed		15,034 1 3	4,77,514 13 1			5,01,422 1 2
Interest received on Investments	16,444 14 0					
Interest received on Advances to Subscribers ..	124 13 3					
Refund of Income Tax deducted on Interest received during 1938-1939	242 1 0					
		16,811 12 3				
Less—Interest paid during the year to Subscribers who have resigned :—						
On their own Contributions	139 15 10					
On Committee's ,, ...	135 15 6					
Interest paid in advance at the time of purchase of Government Securities (since received) ..	874 13 11					
Income Tax deducted from interest on Investments (recoverable) ..	258 5 0					
Carried over ..	1,409 2 3	16,811 12 3	4,77,514 13 1	Carried over ..		5,01,422 1 2

PROVIDENT FUND ACCOUNT AS AT 31st MARCH, 1940.

RECEIPTS.	Rs. a. p.	Rs a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Brought forward ..	1,409 2 3	16,811 12 3	4,77,514 13 1	Brought forward		5,01,422 1 2
Withdrawal charges for Securities redeemed ...	43 3 0					
Bank's Commission for collection of interest and cost of stamps	22 3 0					
Cost of Stationery	15 10 0					
		1,490 2 3				
			15,321 10 0			
Investment Fluctuation Account :—						
Net Appreciation in Market Value of Securities			3,130 13 0			
Suspense Receipts :—						
Amounts due to Subscribers resigned but remained unpaid during the year :—						
Mr. W. R. Sahani		1,475 10 5				
Mr. Luchmandas		641 1 2				
Dr. S. S. Verma		3,338 1 6				
			5,454 13 1			
TOTAL			5,01,422 1 2	TOTAL ..		5,01,422 1 2

BOMBAY, 24*th June* 1940.

Examined and found correct.

Sd.) S. B. BILLIMORIA & Co.,

Registered Accountants, Auditors.

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE UP TO 31ST MARCH, 1940.

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March, 1940.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of permanent or a semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
	Rs. a. p.			Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
II. Technological Research :—									
(1) Technological Laboratory:—									
(*a*) Capital Expenditure ..	5,82,399 3 8	Permanent.	1923	5,82,360 14 2	4,07,988 14 6	1,74,371 15 8	..	..	
(*b*) Working Expenses ..			Jan. 1924	23,45,878 15 1	..	..	57,219 8 3	22,88,659 6 10	
(2) Provincial:—									
(*a*) Capital	8,211 0 0	Permanent.	April 1928	1,57,636 5 9	..	A 7,515 15 7	..	..	A. Provisional figures.
(*b*) Working	1,50,120 6 2		..	..	..	..	1,258 12 10	1,48,861 9 4	
(*c*) Investigation for improving the ginning of Indian Cottons—									
Capital	30,500 0 0		..	..	..	..	..	..	
Working	4,600 0 0								
Development of Alternative uses for Indian Cottons—									
Capital	50,000 0 0	..	..	..	..	..	..	..	
Working	40,263 0 0	..	..	23,210 0 2	..	..	..	23,210 0 2	
A. Seed Distribution and Extension Schemes.									
1. *Bombay Province.*—		Yrs. Mths.							
(*i*) Hubli	50,110 0 0	6 0	June 1930	44,048 8 3	..	..	5 14 0	44,042 10 3	Schemes closed down on 31st May, 1936.
(*ii*) Gadag	54,545 0 0	6 0	June 1930	41,700 15 1	..	..	..	41,700 15 1	
(*iii*) Gadag Supplementary ..	21,448 0 0	4 0	10th June, 1931	20,167 11 4	..	..	2,929 5 6	17,238 5 10	Scheme closed down on 10th June, 1935.
(*iv*) Haveri	27,752 0 0	5 0	..	..	..	..	..	..	Scheme did not start.

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE UP TO 31ST MARCH, 1940—(*contd.*)

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March, 1940.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
(*v*) Athani	46,757 0 0	5 0	5th April 1932	18,086 1 7	..	..	1,722 15 6	16,363 2 1	Scheme closed down on 31st May 1936.
(*vi*) Bailhongal	27,425 0 0	5 0	..	..	..	..	..	..	Scheme did not start.
(*vii*) Surat	..	..	..	..	..	..	..	..	
(*a*) 1027 A. L. F.	1,18,410 0 0	13 0	1st April 1930	74,915 14 10	..	..	..	74,915 14 10	
(*b*) Selection 1A. Cotton	7,272 0 0	3 0	1st Feb. 1940	404 0 0	..	..	..	404 0 0	
(*viii*) Khandesh (Banilla)	2,70,340 0 0 20,787 0 0	5 0 1 0	1st May 1931	1,61,863 5 6	..	..	9,032 14 0	1,52,830 7 6	Receipts amounting to Rs. 1,10,000 anticipated in the scheme. The grant of Rs. 20,787 for the extended period takes into account anticipated receipts amounting to Rs. 6,000. This scheme closed down on the 30th April 1937.
(*ix*) Khandesh (Jarila)	A. 24,828 0 0 77,297 0 0	1 10 3 0	1st May 1937	37,504 6 6	..	2,970 0 0	605 12 6	33,928 10 0	*A.* Excludes anticipated receipts amounting to Rs. 6,500.
(*x*) Deccan Canals (Banilla)	B 24,465 0 0 1,313 0 0	5 0 5 0	1st Apr. 1934	2,859 3 4	..	..	111 1 6	2,748 1 10	*B.* The scheme was expected to be self-supporting but due to low prices the full receipts anticipated were not realised.
(*xi*) B. D. 8.	47,501 0 0	8 0	1st Dec. 1935	17,152 3 0	..	..	217 9 6	16,934 9 6	

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE UP TO 31ST MARCH, 1940—(*contd.*)

MAJOR HEADS.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March, 1940.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	REMARKS.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
(*xii*) Revised Jayawant and Gadag No. 1.	C 2,66,772 0 0	5 0	1st June 1936	1,02,576 12 4	..	..	136 1 6	102,440 10 10	*C.* This grant is subject to the condition that the Bombay Govt. bears 25% of the net cost calculated after deducting total savings under the Hubli Gadag, Athani, Haveri and Bailhongal schemes.
	D 10,084 0 0	1 0	..	32,661 14 9	..	..	28 6 0	32,633 8 9	
(*xiii*) Maintenance of nucleus of pure seed of improved varieties of cotton	13,300 0 0	5 0	Sept. 1937	5,645 6 9	..	..	14 12 0	5,630 10 9	*D.* The Committee bears 15% of the cost of Scheme during the extension period. Govt. of Bombay sanction to the extension awaited.
2. *Madras* :—									
(*i*) Pay and allowance of Business Manager, Tiruppur	24,940 0 0	6 4	18th May 1931	24,079 13 0	..	..	162 4 0	23,917 9 0	Scheme closed down on 17th August 1937.
(*ii*) Co. 2	E 81,310 0 0	6 0	15th Sept. 1932	41,286 3 3	..	..	83 13 0	41,202 6 3	*E.* Scheme closed down on 17th Aug. 1937 and recommenced from 19th Oct. 1938 for one year's extension.
	63,357 0 0	4 5							
(*iii*) H. 1	18,860 0 0	2 0	6th May 1933	3,952 2 9	..	..	..	3,952 2 9	Scheme closed down on 16th July 1934.
(*iv*) Maintenance of nucleus of pure seed of improved varieties of cotton	3,050 0 0	5 0	12th Sept. 1938	1,153 5 3	..	..	..	1,153 5 3	
3. *Punjab*—Lyallpur Ginnery ..	18,125 0 0	..	..	16,038 3 3	9,221 5 0	6,816 14 3	..	..	

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE UP TO 31st MARCH, 1940—(*contd.*)

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March, 1940.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
4. *Sind* :—									
(*i*) Seed Distribution and Extension Scheme.	4,34,302 0 0	10 0							*F*. The Committee bears 15% of the cost of the scheme during the extension for 5 years.
F	42,471 0 0	5 0	1st April 1931	3,79,613 2 9	..	..	..	3,79,613 2 9	
(*ii*) Maintenance of nucleus of pure seed of improved varieties of cotton.	12,500 0 0	5 0	1st April 1938	5,000 0 0	..	..	2 0 0	4,998 0 0	
(*iii*) Financing of Seed Distribution.	1,35,000 0 0	3 0	..	..	..	..	..	..	Not yet started.
5. *Central Provinces & Berar* :—									
Maintenance of nucleus of pure seed of improved strains of cotton.	7,000 0 0	5 0	April 1939	1,400 0 0	..	..	1 2 0	1,398 14 0	
6. *Hyderabad* :—									
Seed Distribution and Extension Scheme.	35,466 0 0	6 6	1st March 1930.	48,346 5 3	..	..	..	*P* 48,346 5 3	*G*. The amount represents the Committee's share of expenditure which is borne on 50 : 50 basis between the Hyderabad State and the Committee.
G	25,799 0 0	4 6							
7. *Baroda* :—									
(*i*) Navsari Seed Storage Scheme.	55,488 0 0	10 0	16th April 1934	18,821 11 7	..	..	446 12 0	18,374 15 7	*P*. Provisional figure.
(*ii*) B. D. 8	17,300 0 0	5 0	1st April 1939	2,699 0 0	..	..	..	2,699 0 0	

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE UP TO 31ST MARCH, 1940—(*contd.*)

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March, 1940.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
8. *United Provinces*—C.402 ..	45,800 0 0	5 0	1st May 1935	18,617 7 6	..	..	300 0 0	18,317 7 6	Scheme closed down on 15th February 1938.
B. Marketing Schemes.									
1. *Central Provinces and Berar* :—									
(*i*) Verum Cotton	1,17,900 0 0	3 8	1st Sept. 1930	73,544 2 5	..	..	..	73,544 2 5	Scheme closed down on 30th April 1934.
(*ii*) Extension and Marketing of V. 434 Cotton	2,18,819 0 0 33,725 0 0 71,578 0 0	5 2½ 3 0 3 0	1st April 1934	2,03,258 8 2	..	..	330 0 0	2,76,472 10 7	
(*ii*) Distribution and marketing of Buri 107 cotton in Burhanpur Tehsil.	15,300 0 0	3 0	April 1939	5,698 0 0	..	..	..	5,698 0 0	

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE UP TO 31st MARCH, 1940.—*(contd.)*

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March, 1940.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
AGRICULTURAL RESEARCH—GRANTS IN AID.									
Research Schemes.									
Bombay :—									
1. Surat Physiological „ Writing-up	2,91,445 0 0	10 1½	Sept. 1923	2,50,954 2 11	..	..	23,334 5 2	2,27,619 13 9	Physiological scheme closed down on 4th August 1932 and Writing-up scheme on 17th October 1933.
2. A. Surat Boll-worm ..	1,20,720 0 0	7 7	Sept. 1923	1,14,509 9 7	..	..	4,707 8 7	1,09,802 1 0	Scheme closed down on 31st March 1931.
B. „ „ Writing up	2,420 0 0	0 4	July 1932	2,315 3 0	..	..	..	2,315 3 0	
C. „ Boll-worm Propaganda and clean-up	1,28,764 0 0	4 0	1st April 1931	91,468 9 2	..	..	10,828 0 11	80,640 8 3	
3 A. Dharwar Wilt and Cotton Breeding.	2,63,545 0 0	8 11	Sept. 1923	1,82,836 4 11	..	..	13,713 3 7	1,69,123 1 4	Schemes closed down on 31st July 1932 and in July 1929.
B. „ Writing up.	11,355 0 0	0 10	1st June 1932	10,902 10 3	..	..	..	10,902 10 3	Scheme closed down on 31st March 1933.
4. Khandesh Cotton Breeding	27,995 0 0	5 5½	15th Oct. 1926	26,573 5 0	..	..	..	26,573 5 0	Scheme closed down on 31st March 1932.
5. Co-ordination of Cotton Research.	23,991 0 0	..	Not started.	1,749 7 6	..	..	..	1,749 7 6	
6. Jalgaon Cotton Breeding ..	76,061 0 0	10 0	1st April 1932	56,867 2 9	..	..	4,044 5 0	52,822 13 9	
7. Broach Cotton Breeding ..	1,20,910 0 0	10 0	1st April 1932	74,458 4 11	..	..	6,882 12 7	67,575 8 4	
8. Small leaf Disease Survey ..	5,118 0 0	1 0	6th Nov. 1933	3,938 9 6	..	..	495 2 6	3,443 7 0	Scheme closed down on 31st Oct. 1934.
9. Survey of Goghari Cotton in Gujerat.	5,000 0 0	5 0	16th Jan. 1935	4,199 5 0	..	..	..	4,199 5 0	Scheme closed down on 31st March 1939.

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE UP TO 31ST MARCH, 1940—(*contd.*)

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March, 1940.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
Bombay—contd.	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
10. Defibration of Cotton Seed— (*a*) Recurring .. .. (*b*) Non-Recurring ..	5,250 0 0 3,700 0 0	3 0	1st Feb. 1936	4,878 5 9	..	3,697 7 10	39 10 1	1,141 3 10	
11. Plant Puller Propaganda in Surat, Broach and Panch Mahals Districts.	42,524 0 0	7 0	March 1934	17,792 8 9	..	..	*A* 817 12 0	16,974 12 9	This continuation scheme is financed partly from the savings of the Surat Clean-up scheme. *A* Provisional figure.
12. Breeding of Wilt Resistant Cotton for Surat Area.	14,385 0 0	5 7	1st April 1937	6,859 11 0	..	..	376 8 9	6,483 2 3	
13. Cotton Wilt Breeding scheme, Poona. ..	42,350 0 0	5 0	1st April 1937	23,919 8 0	..	..	4,280 3 5	19,639 4 7	
14. Inclusion of Northerns and Westerns Cottons in Programme of Dry Farming Scheme, Bijapur.	7,908 0 0	4 0	1st June 1937	5,059 7 6	..	..	1,092 9 9	3,966 13 9	
15. Inter-specific Hybridisation in cottons at Surat.	40,059 0 0	5 0	1st Nov. 1938	3,960 8 0	..	..	650 0 0	3,310 8 0	
16. Improvement of Cotton crop in Kaira District.	13,880 0 0	5 0	Not started.	..	..	..	..	..	
17. Improvement of Dholleras Cottons-Wagad cotton at Viramgam.	27,110 0 0	5 0	1st May 1937	14,196 11 5	..	..	1,226 1 11	12,970 9 6	
18. Model Project for extention of improvements in cultivation of crop in Surat District.	2,456 0 0 *B* 1,423 0 0	3 0 2 0	Not started.	..	..	..	..	..	*B* Subject to Govt. of India sanction.

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE UP TO 31ST MARCH, 1940—(*contd.*)

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March, 1940	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
Madras :—									
(*a*) Herbaceum	1,47,068 0 0	14 6	1st Dec. 1923	1,42,466 13 1	..	..	4,431 7 0	1,38,035 6 1	Scheme closed down on 31st May 1938.
(*b*) Pempheres and Physiological.	2,12,779 0 0	10 0	16th Sept. 1931	1,75,245 9 11	..	..	8,082 6 10	1,67,163 3 1	
(*c*) Fodder Cholam :—									
(*i*) Capital	900 0 0	6 5	14th Jan. 1931	19,517 9 4	..	881 11 7	..	..	Scheme closed down on 14th June 1937.
(*ii*) Recurring	21,010 0 0				..	..	291 3 4	18,344 10 5	
(*d*) Breeding of Nadam Cotton	18,203 0 0	8 0	14th June 1933	15,190 5 1	..	..	425 14 9	14,764 6 4	
(*e*) Improvement of Mungari Cotton.	23,534 0 0	5 0	24th May 1937	11,086 14 10	..	..	117 2 11	10,969 11 11	
(*f*) Improvement of Cocanadas Cotton.	35,309 0 0	5 0	1st Feb. 1940	727 0 0	..	..	2 0 0	725 0 0	
(*g*) Investigation of possibilities of Control of Cotton Stem Weevil of South India.	5,500 0 0	1 0	30th Oct. 1939	2,400 0 0	..	..	76 5 0	2,323 11 0	
Punjab :—									
(*a*) Botanical :—									
(*i*) Capital	31,330 0 0	20 7½	13th Aug. 1925	5,71,287 3 8	22,158 0 0	9,102 11 0	..	..	Rs. 2,030 transferred to Capital.
(*ii*) Working Expenses ..	7,98,268 0 0					5,826 3 10	35,074 4 5	5,04,052 4 3	
(*b*) Entomological :—									
(*i*) Capital	6,000 0 0	11 11	4th May 1926	2,25,908 7 11	..	5,826 3 10	..	..	Scheme closed down on 31st March 1938.
(*ii*) Working Expenses (Pink and Spotted Bollworm.)	2,49,646 0 0				..	..	6,367 4 11	2,13,714 15 2	

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE UP TO 31ST MARCH, 1940—(*contd.*)

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March, 1940	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
Punjab—contd.									
(*c*) White Fly	56,087 0 0	5 5	1st May 1931	48,721 4 1	..	..	6,762 15 0	41,958 5 1	Scheme closed down on 30th Sept. 1936.
(*d*) Root Rot :—									
(*i*) Non-Recurring	3,000 0 0	8 6	1st Sept. 1932	58,514 6 8	..	..	499 6 6	58,015 0 2	
(*ii*) Recurring	69,129 0 0								
(*e*) Spraying Trials	14,400 0 0	..	8th July 1933	10,191 13 6	..	..	2,372 2 3	7,819 11 3	
(*f*) Physiological (Cotton Failure Research.) ..	3,77,156 0 0	8 0	15th March 1935	2,26,169 12 1	..	..	22,090 8 0	2,04,079 4 1	
(*g*) Clean-up Campaign.. ..	64,580 0 0	2 10	1st April 1937	58,088 15 0	..	..	10,206 12 2	47,882 2 10	
(*h*) Defibrating & Delinting :—									
(*i*) Reccuring	1,000 0 0	2 0	..	6,112 8 9	..	..	17 12 0	222 2 9	
(*ii*) Non-Recurring	6,700 0 0				..	5,872 10 0	..	..	
(*i*) Survey of disease of malformation.	2,674 0 0	0 10	1st June 1934	1,730 10 6	..	..	..	1,730 10 6	Scheme closed down on 31st March, 1935.
(*j*) Cotton Jassid Investigation.	18,673 0 0	6 0	1st April 1937	8,930 8 3	..	..	345 6 3	8,585 2 0	
(*k*) Improvement of Punjab American 289F Cotton ..	14,000 0 0	5 0	9th July 1938	4,759 2 0	..	..	114 14 3	4,644 3 9	
Central Provinces and Berar :—									
(*a*) Botanical	61,000 0 0	2 6	Oct. 1923	5,04,122 13 4	..	..	5,914 5 10	4,98,208 7 6	The balance of this amounting to Rs. 3,100 - 13 - 5 lapsed on revision.
(*b*) Cotton Breeding	5,36,150 0 0	13 0	1st April 1926						
	68,292 0 0	5 0	1st April 1939						

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE UP TO 31ST MARCH, 1940—(*contd.*)

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March, 1940	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
Central Provinces and Berar :—ctd.									
(*c*) Entomological	13,131 0 0	3 3	2nd July 1934	12,344 13 6	..	..	59 10 6	12,285 3 0	Scheme closed down on 30th Sept. 1937.
(*d*) Investigation of Heliothis Obsoleta.	3,000 0 0	1 5	25th June 1939	959 0 0	..	..	116 14 3	842 1 9	
(*e*) Model Projects for extension of improvements in cultivation of crops.	‡ 2,298 0 0	3 0	Not started	..	..	..	..	..	‡Subject to Govt. of India's sanction.
Sind :—									
(*a*) Physiological	2,74,346 0 0	11 4	10th July 1927	2,63,945 12 10	..	..	17,370 11 9	2,46,575 1 1	Scheme closed down on 30th June 1937.
(*b*) Jassid Investigation ..	11,261 0 0	3 6	9th May 1938	5,500 12 1	..	..	107 11 0	5,393 1 1	
(*c*) Investigation into Black-headed cricket.	13,980 0 0	3 0	30th Sept. 1938	5,680 10 8	..	..	..	*A* 5,670 10 8	*A*. Provisional figures.
(*d*) Cotton Breeding Investigation for the production of long staple cottons for cultivation in Sind.	2,21,140 0 0	5 0	19th April 1940	817 2 3	..	..	..	817 2 3	
(*e*) Boll-worm Investigation and clean-up campaign.	85,900 0 0	3 0	1st Sept. 1940	..	..	..	..	..	
United Provinces :—									
(*a*) Pink Boll-worm :—									
(*i*) Capital	54,000 0 0	8 0	July 1923	1,46,834 1 4	..	49,511 5 6	3,065 4 3	95,257 7 7	Scheme closed down on 31st July 1931.
(*ii*) Working Expenses ..	56,000 0 0				..	..			
(*iii*) Recurring grant for staff.	44,475 0 0	7 9½	1st Oct. 1926		..	..	..	..	Scheme closed down on 12th July 1934.

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE CGMMITTEE UP TO 31ST MARCH, 1940—(*contd.*)

MAJOR HEADS.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March, 1940.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	REMARKS.
					Lands and Buildings.	Machinery apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
United Provinces—contd.									
(*b*) Rohilkhand and Bundelkhand Cotton Survey.	19,000 0 0	3 8	1st July 1933	18,382 10 4	..	..	1,529 12 1	16,852 14 3	Scheme closed down on 1st March 1937.
(*c*) Botanical	91,380 0 0	5 0	22nd Aug. 1938	26,111 3 3	..	..	7,554 8 6	18,556 10 9	‡ Subject to Govt. of India's sanction.
(*d*) Model Projects for extension of improvement in cultivation of crop. ‡	3,783 0 0	5 0	Not started.	..	..	..	..	..	
Bengal Comilla Cotton	38,658 0 0	7 4	1st Dec. 1934	24,658 12 9	..	..	1,034 0 3	23,624 12 6	
Baluchistan :—									
Co-ordination on Research work on Black-headed Cricket in Sind and British Baluchistan.	3,920 0 0	2 0	Not started	..	..	..	..	..	
Burma :—									
(*a*) Capital	3,000 0 0	..	..	2,906 15 5	..	2,906 15 5	..	..	
(*b*) Cotton Improvement ..	49,032 0 0	6 0	1st April 1931.	47,790 3 9	..	..	4,234 5 0	43,555 14 9	Scheme closed down on 31st March 1937.
Indore :—									
(*a*) Institute of Plant Industry									
(*i*) Capital	2,83,535 12 10	Permanent.	Oct. 1924	18,66,943 12 0	2,12,552 11 5	70,983 1 5	..	..	Rs. 50,202-12-10 transferred from recurring grant to Capital.
(*ii*) Working Expenses ..	15,83,407 15 2				..	..	31,857 4 4	15,41,550 10 10	
(*b*) Cotton Genetics Research ..	71,180 0 0	2 0	1st April 1940.	..	..	..	..	..	

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE UP TO 31ST MARCH, 1940—(*contd.*)

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March, 1940.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
Hyderabad :—									
(*a*) Botanical	4,92,969 0 0	14 11	10th May 1929	3,42,033 3 8	..	..	20,174 12 10	3,21,858 6 10	
(*b*) Cotton Survey	39,165 0 0	5 0	28th June 1931	36,578 3 0	..	..	187 11 10	36,390 7 2	Scheme closed down on 27th June 1936.
(*c*) Pink and Spotted Boll-worm and Clean-up campaign.	1,51,018 0 0	7 10	1st June 1933	1,20,466 1 10	..	..	*A* 828 5 1	1,19,637 12 9	*A.* Provisional figure.
(*d*) Improvement of Kumpta Cotton.	32,542 0 0	5 0	28th Nov. 1937	14,011 15 7	..	..	*A* 415 14 1	13,596 1 6	
(*e*) Inclusion of Northerns and Westerns in programme of Dry Farming Research, Raichur.	1,723 0 0	4 0	1st Sept. 1937	1,095 0 0	..	..	..	1,095 0 0	
(*f*) Improvement of Cottons of‡ the Oomra tract.	60,412 0 0	5 0	Not started	..	..	..	..	..	‡ Subject to Govt. of India's sanction.
Baroda :—									
(*a*) Root Rot :—									
(*i*) Capital	4,000 0 0	10 4	1st Feb. 1932	76,787 14 7	..	..	12,374 0 7	64,413 14 0	
(*ii*) Recurring Expenses ..	91,569 0 0								
(*b*) Comparative tests of 1027 A. L. F. and 1A Cottons.	4,280 0 0	1 2	1st April 1932	4,251 5 3	..	..	145 11 6	4,105 9 9	Scheme closed down on 15th June 1933.
(*c*) Survey of Goghari Cotton	5,000 0 0	5 0	1st Feb. 1935	3,472 7 0	..	..	..	3,472 7 0	Scheme closed down on 31st May 1938.
(*d*) Plant Puller Propaganda ..	41,853 0 0	6 0	1st Jan. 1936	24,088 7 9	..	..	585 14 0	23,502 9 9	
(*e*) Improvement of Dholleras Cottons-Mathio cotton at Amreli and Jagudan.	21,570 0 0	5 0	4th June 1937	9,764 0 4	..	..	811 14 4	8,952 2 0	

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE UP TO 31ST MARCH, 1940—(*contd.*)

Major Heads.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March, 1940.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Net working expenses, *i.e.*, staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	Remarks.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1	2	3	4	5	6	7	8	9	10
Bikaner :—	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
Bengals Cotton Improvement—									
(*i*) Capital	14,500 0 0	10 0	1 st Jan. 1931	57,199 5 2	8,584 6 9	3,835 5 0	..	..	
(*ii*) Working ..	65,320 0 0								
	‡ 15,821 0 0	5 0	..	..	..	..	1,263 6 0	43,516 3 5	
Mysore (Doddahathi) Cotton ..	18,416 0 0	6 0	1st Nov. 1935	11,050 3 0	..	..	97 3 0	10,953 0 0	‡ Subject to Govt. of India's sanction.
Cutch :—									
Improvement and development of Cotton.	40,790 0 0	5 0	Not started	..	..	..	..	..	
Collection of Herbaceum Cottons in Iran.	4,000 0 0	..	31st Aug. 1936	3,144 3 0	..	..	..	3,144 3 0	
Improvement of Dholleras Cottons-Preliminary trials at Nawanagar.	900 0 0	0 4	1st June 1936	323 12 4	..	..	..	323 12 4	
Estimation of effects on Cotton crop of use of Plant Pullers.	4,738 0 0	2 0	1st Dec. 1936	4,143 12 5	..	..	2 4 0	4,141 8 5	Scheme closed down on 31st May 1938.
Marketing Schemes :—									
(*a*) Marketing of 1027 A. L. F. Cotton of Baroda State.	12,910 0 0	5 0	1st Feb. 1938	3,612 14 10	..	..	..	3,612 14 10	
(*b*) Cotton Marketing Survey in the Punjab.	7,634 0 0	1 3	16th Sept. 1938	7,328 2 3	..	..	79 9 0	7,243 9 3	Scheme closed down on 15th February 1940.

APPENDIX III.

Revised Trade Classification of Indian Cottons.

Trade Descriptions.	Tracts included.
I. BENGALS.—	
(1) U. P. Deshi	United Provinces (including Rampur State), Delhi, Bihar, Orissa [excluding the districts of (*i*) Koraput and (*ii*) Ganjam (other than the Khondmals)], Bundelkhand Agency of Central India, Rewa State of Central India Residency (Indore), and Western Bengal (Bankura and Midnapore districts).
(2) Punjab Deshi	Punjab (including Indian States except Khairpur State) and North-West Frontier Province).
(3) Sind Deshi ..	Sind (including Khairpur State).
(4) Rajputana Deshi.	Ajmer-Merwara and Rajputana States (excluding Jhalawar and Partabgarh States and Sironj, Chhabra and Pirawa parganas of Tonk State).
II. AMERICANS	
(1) Sind-American	Sind (including Khairpur State).
(2) Punjab-American.	Punjab (including Indian States except Khairpur State).
(3) Buri ..	Burhanpur *tahsil* of Nimar district of Central Provinces.
III. OOMRAS—	
(1) C.P. Oomras	Central Provinces (excluding Nimar district); and Yeotmal district of Berar.
(2) Berar Oomras	Berar (excluding Yeotmal district).
(3) Nimar Oomras	Nimar district of Central Provinces.
(4) C.P. and Berar Verum.	Central Provinces and Berar.
(5) Khandesh Oomras.	Nasik, East Khandesh (excluding Amalner taluka) and West Khandesh (excluding Nawapur and Shirpur talukas) districts of Bombay Province.
(6) Khandesh Banilla.	Amalner taluka of East Khandesh district and Shirpur taluka of West Khandesh district of Bombay Province.
(7) Barsi-Nagar Oomras.	Ahmednagar, Poona and Sholapur districts of Bombay Province and Akalkot State.

Trade Descriptions.	Tracts included.
III. OOMRAS—(*contd*).	
(8) Hyderabad Oomras.	Aurangabad, Bir (excluding Mominabad taluka), Parbhani, Adilabad (excluding Nirmal taluka), Osmanabad (excluding the protected tract included under "Hyderabad-Gaorani") and Nizamabad districts of Hyderabad State.
IV. HYDERABAD-GAORANI.	The Hyderabad-Gaorani Protected Area of Hyderabad State comprising: the districts of Nander and Bidar, part of Osmanabad district, Nirmal taluka of Adilabad district and Mominabad taluka of Bir district.
V. CENTRAL INDIA—	
(1) Malvi (2) Central India—Others.	Gwalior State, Indore State, Bhopal Agency and Malwa Agency of Central India; Jhalawar and Partabgarh States and Sironj, Chhabra and Pirawa parganas of Tonk State of Rajputana.
VI. BROACH	Kaira district and Broach and Panch Mahals district (excluding Ankleshwar taluka) of Bombay Province, certain States* in the Gujarat States Agency and Baroda district of Baroda State.
VII. SURTI	Ankleshwar taluka of Broach and Panch Mahals district, Surat district and Nawapur taluka of West Khandesh district of Bombay Province, Rajpipla, Sachin, Bansda and Dharampur States of the Gujerat States Agency and Navsari district of Baroda State.
VIII. DHOLLERAS.—	
(1) Gujerat—Dholleras.	"Wagad," "Lalio" and other staple cottons grown in Ahmedabad district of Bombay Province, Mehsana district of Baroda State and in part of Western India States Agency.
(2) Gujerat—Short-Staple	Short-staple cottons grown in part of Western India States Agency.
(3) Kathiawar—Dholleras.	"Wagad," "Kala" and other staple cottons grown in part of Western India States Agency.
(4) Kathiawar—Short-staple.	"Mathia" and other short-staple cottons grown in part of Western India States Agency and in Amreli district of Baroda State.
(5) Cutch Dholleras. ..	Cutch State.

* Including Balasinor, Baria, Cambay, Chota Udepur, Lunawada, Sant, Jambugoda Kadana, Mandwa, Vajiria and Bhaderwa.

Trade Descriptions.	Tracts included.
IX. SOUTHERNS.—	
(1) Kumpta and Upland.	Dharwar, Belgaum and Satara districts of Bombay Province; Satara Jagirs; S. M. C. States; Mysore State (excluding Mysore and Bangalore districts); and Raichur Protected Area in Raichur district of Hyderabad State.
(2) Bijapur and Bagalkot Jowari.	Bijapur district of Bombay Province.
(3) Westerns ..	Bellary, Anantapur and Cuddapah districts and Pattikonda taluka of Kurnool district of Madras Province; Raichur district (excluding the Raichur Protected Area) and Gulbarga district of Hyderabad State.
(4) White and Red Northerns.	Kurnool district (excluding Pattikonda taluka but including Banganapalle State) of Madras Province.
(5) Warangal and Cocanadas.	Nellore, Guntur, Kistna, East Godavari and West Godavari districts and Golgonda taluka of Vizagapatam district of Madras Province; Warangal, Karimnagar, Nalgonda, Mahboobnagar, Atrafibalda and Medak districts of Hyderabad State.
(6) Chinnapathi (Short-staple).	Ganjam (excluding the Khondmals) and Koraput districts of Orissa; and Vizagapatam (excluding Golgonda taluka) district of Madras Province.
X. TINNEVELLIES.—	
(including Karungannies).	Coimbatore, Madura, Ramnad and Tinnevelly districts of Madras Province.
XI. CAMBODIAS ..	North Arcot, South Arcot, Coimbatore, Salem, Trichinopoly (including Pudukkottai State), Madura, Ramnad, Tinnevelly, Chittoor and Chingleput districts of Madras Province.
XII. SALEMS	South Arcot, Coimbatore, Salem, Trichinopoly, Tanjore, Malabar and South Kanara districts of Madras Province; and Mysore district of Mysore State.
XIII. COMILLAS	Assam; and Eastern Bengal (Mymensingh and Chittagong Hill Tracts districts and Tripura State).

APPENDIX IV.

INDIAN RAW COTTON CONSUMED IN INDIAN MILLS.

(Based on returns made under the Indian Cotton Cess Act, 1923, by mills in British India, and on voluntary returns from mills in Indian States).

Cotton Year : 1st September to 31st August.

(In Bales of 400 lbs. nett.)

	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	†1936-37.	1937-38.	1938-39.	1939-40.
Bombay Island ..	731,937	747,988	435,426	542,036	766,375	664,546	611,606	565,084	491,709	687,287	664,199	636,720	782,815	750,317	634,149
Ahmedabad	286,800	264,139	298,075	318,983	344,021	321,503	322,257	348,009	373,345	326,558	320,982	304,398	346,269	346,375	305,459
Bombay Province ..	1,189,539	1,167,892	894,671	1,044,925	1,300,859	1,173,659	1,132,645	1,116,297	1,063,549	1,230,616	1,189,310	1,128,744	1,353,998	1,316,313	1,172,285
Madras Province ..	176,274	185,207	194,591	204,284	211,488	214,759	260,707	292,013	278,060	312,164	365,423	412,268	422,573	480,839	507,085
United Provinces ..	191,740	204,702	170,846	182,462	234,205	235,623	256,820	273,573	277,230	292,424	317,011	299,073	288,320	356,331	349,340
Central Provinces and Berar	109,995	111,292	116,888	121,391	123,146	118,492	115,018	111,208	112,660	125,014	130,298	122,987	146,587	164,616	142,868
Bengal	77,949	89,763	82,086	84,212	99,075	91,993	102,390	103,784	107,633	101,101	98,892	79,044	92,546	90,611	101,078
The Punjab and Delhi.	35,394	40,687	45,638	54,575	64,464	73,736	89,681	80,854	71,939	83,897	89,430	93,886	94,742	133,347	144,234
Rest of British India	17,313	13,190	15,040	22,189	24,458	27,101	30,342	31,935	35,139	38,575	38,010	35,823	46,840	49,806	44,867
Total—British India..	1,798,204	1,812,733	1,519,760	1,714,038	2,057,695	1,935,363	1,987,603	2,009,664	1,946,210	2,183,791	2,228,374	2,172,725	2,445,606	2,591,863	2,461,757
Total—Indian States*	187,614	229,443	251,589	277,540	315,399	333,996	358,793	351,260	390,116	428,341	449,314	460,060	554,003	559,202	555,387
TOTAL—INDIA ..	1,985,818	2,042,176	1,771,349	1,991,578	2,373,094	2,269,359	2,346,396	2,360,924	2,336,326	2,612,132	2,677,688	2,632,785	2,999,609	3,151,065	3,017,144

* Figures for Indian States up to and including 1930-31, being based on yarn production returns, include foreign cotton also.

† From April 1937 figures for Burma have been excluded.

INDIAN RAW COTTON CONSUMED IN MILLS IN INDIAN STATES.

(Based on voluntary returns from mills in Indian States).

N.B.—Figures up to and including 1930-31, being based on yarn production, include foreign cotton also.

Cotton Year : 1st September to 31st August.

(In Bales of 400 lbs. nett.)

	1926-27	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.	1937-38.	1938-39.	1939-40.
Hyderabad	15,210	16,697	19,067	20,823	23,074	31,290	33,488	33,231	45,588	51,771	49,981	63,093	68,156	67,995
Mysore	43,571	44,320	39,619	46,590	43,326	49,293	50,596	47,168	51,196	50,824	53,236	55,244	53,858	67,710
Baroda	46,070	46,884	48,852	59,043	62,578	58,534	50,587	53,612	57,146	51,963	51,761	70,686	73,278	65,573
Gwalior	24,257	25,716	36,708	41,463	45,207	45,892	43,306	49,362	56,318	72,163	79,079	89,243	94,090	88,688
Indore	53,526	65,391	76,070	83,026	88,620	95,296	91,036	111,430	114,229	113,379	106,454	147,766	140,792	120,186
Kathiawar States	} 46,809	52,581	57,224	64,454	{ 20,283	18,849	18,868	26,506	35,438	37,397	42,717	48,545	44,109	42,533
Other Indian States					32,558	39,382	40,209	45,197	45,735	51,462	57,767	57,119	58,444	} 102,702
Pondicherry					18,350	20,257	23,170	23,610	22,691	20,355	19,065	22,307	26,475	
Total—Indian States	229,443	251,589	277,540	315,399	333,996	358,793	351,260	390,116	428,341	449,314	460,060	554,003	559,202	555,387

LOOSE (UNPRESSED) INDIAN RAW COTTON RECEIVED IN SPINNING MILLS IN BRITISH INDIA.

(Based on voluntary returns furnished by mills.)

Cotton Year : 1st September to 31st August.

(In Bales of 400 lbs. nett.)

	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	‡1936-37.	1937-38.	1938-39.	1939-40.
Bombay Province	28,328	24,970	27,324	24,361	54,409	74,979	80,092	74,868	58,355	75,617	67,219	74,750	80,164	86,687
Madras Province	35,198	39,560	52,188	46,582	55,717	99,389	96,340	110,875	123,260	147,044	173,102	156,675	162,489	175,540
United Provinces	16,991	10,308	13,878	20,441	18,496	14,367	19,236	17,871	10,090	10,405	10,659	15,719	17,532	20,279
Central Provinces and Berar	40,762	20,861	6,924	16,243	15,771	20,743	17,462	18,382	20,544	27,502	26,321	32,860	26,980	29,052
Bengal*	..	..	..	..	..	..	..	..	..	..	90	..	..	3
The Punjab and Delhi†	3,910	4,739	3,760	4,361	4,307	2,317	2,149	..	5,535	3,110	28,385	23,873	25,960	22,840
Rest of British India*	..	..	..	..	..	..	..	..	..	..	19,282	17,160	22,916	12,734
Total—British India	125,189	100,438	104,074	111,988	148,700	211,795	215,279	221,996	217,784	263,678	325,058	321,037	336,041	347,135
Indian States*	..	..	..	..	..	..	..	..	..	..	131,149	109,003	122,078	116,893
Total—INDIA*	..	..	..	..	..	..	..	..	..	..	456,207	430,040	458,119	464,028

* Figures up to 1935-36 not complied.

† Figures up to 1935-36 exclude Delhi.

‡ From 1936-37 the figures refer to consumption and not receipts and are based on returns furnished under the Indian Cotton Cess Act, 1923, by mills in British India and on voluntary returns from mills in Indian States. From April 1937 figures for Burma have been excluded.

APPENDIX V.

STOCKS OF INDIAN RAW COTTON HELD IN INDIA BY THE MILLS AND THE TRADE ON 31st AUGUST, 1939 AND 1940.

(In thousand bales * of 400 lbs. each.)

Trade Descriptions of Cotton.	Trade Stocks on 31st August.								Mill Stocks on 31st August.		Total Trade and Mill Stocks on 31st August,	
	Bombay Island.		Karachi.		Rest of India.		Total India.		Total India.			
	1939.	1940.	1939.	1940.	1939.	1940.	1939.	1940.	1939.	1940.	1939.	1940.
BENGALS—												
U. P. Deshi	—	—	—	1	(a) 12	(a) 6	12	7	37	41	49	48
Punjab Deshi	—	—	51	74	(b) 3	(b) 3	54	77	25	27	79	104
Sind Deshi	—	—	6	20	—	—	6	20	1	1	7	21
Rajputana Deshi	—	—	—	—	—	—	—	—	14	9	14	9
Unclassified	29	22	4	2	—	—	33	24	5	—	38	24
Total	29	22	61	97	15	9	105	128	82	78	187	206
AMERICANS—												
Sind Sudhar (289-F-1)	24	8	3	1	—	—	27	9	19	19	46	28
Sind (Unspecified & 4-F-98)	3	4	13	18	(d) 1	—	17	22	23	24	40	46
Punjab-289-F	26	4	7	9	(b) 1	(b) 1	36	18	67	56	124	96
Punjab-L. S. S.			1	3	(b) 1	(b) 1			21	22		
Punjab-(Unspecified-4F)	4	8	14	91	(b) 8	(b) 5	26	104	172	113	198	217
Buri	—	—	—	—	—	—	—	—	—	1	—	1
Dharwar-(Gadag 1)	—	—	—	—	(e) 7	(e) 5	7	5	5	3	12	8
Dharwar-(Upland-Unspecified)	—	—	—	—	—	(m)11	—	11	6	3	6	14
Cambodia Co_2	—	—	—	—	—	—	—	—	46	40	46	40
Cambodia (Unspecified)	1	—	—	—	(f) 31	(f) 39	32	39	15	18	47	57
Total	58	24	38	122	49	62	145	208	374	299	519	507
OOMRAS—						(g) &						
C. P. and Nimar Oomras	8	41	—	—	(g) 6	(h) 25	14	66	13	41	27	107
Berar Oomras	14	66	—	—	(h) 16	(h) 38	30	104	26	22	56	126
C. P. & Berar Verum	—	—	—	—	—	—	—	—	13	27	13	27
Khandesh Oomras	17	25	—	—	(i) 4	(i) 6	21	31	15	11	36	42
Khandesh Banilla	—	—	—	—	—	—	—	—	16	8	16	8
Barsi-Nagar Oomras	14	35	—	—	(j) 46	31	60	66	9	12	69	100
Hyderabad Oomras										22		
Total	53	167	—	—	72	100	125	267	92	143	217	410
HYDERABAD GAORANI	—	1	—	—	(j) 18	(j) 4	18	5	42	43	60	48
CENTRAL INDIA—												
Malvi	—	—	—	—	(k) 2	—	2	—	28	17	30	17
Central India—Others	11	21	—	—	(l) 34	(l) 38	45	59	12	16	57	75
Total	11	21	—	—	36	38	47	59	40	33	87	92
BROACH	45	119	—	—	(d) 7	(d) 17	52	136	44	63	96	199
SURTI	42	39	—	—	—	—	42	39	59	49	101	88
DHOLLERAS—												
Gujarat-Dholleras	52	17	—	—	(c) 9	(c) 6	61	23	42	16	103	54
Gujarat-Short staple										6		
Kathiawar-Dholleras										9		
Kathiawar-Short staple	4	5	—	—	—	—	4	5	4	2	8	7
Cutch-Dholleras	—	—	—	—	—	—	—	—	1	—	1	—
Total	56	22	—	—	9	6	65	28	47	33	112	61
SOUTHERNS—												
Kumptas Jayawant	—	—	—	—	(m) 8	(m)10	8	10	36	33	44	43
Kumptas (Unspecified)	37	6	—	—	(n) 1	(o) 5	38	11	30	41	68	52
Bijapur and Bagalkot Jowari										9		
Westerns	41	9	—	—	(r) 60	(r) 67	101	76	97	39	198	136
White & Red Northerns										12		
Warangal and Cocanadas	—	—	—	—	(f) 14	(p) 21	14	21	10	6	24	27
Chinnapathi (Short staple)	—	—	—	—	—	—	—	—	—	—	—	—
Total	78	15	—	—	83	103	161	118	173	140	334	258
TINNEVELLIES (including Karungannies)												
Tinnevellies	—	—	—	—	(f) 26	(f) 25	26	25	25	25	51	50
Karungannies	—	—	—	—	—	—	—	—	20	27	20	27
Total	—	—	—	—	26	25	26	25	45	52	71	77
SALEMS	—	—	—	—	(f) 9	(f) 10	9	10	1	1	10	11
COMILLAS	—	—	—	—	—	—	—	—	—	—	—	—
Unclassified	3	6	—	—	(d) 5	(d) 8	8	14	4	—	12	14
Total Indian Cotton	375	436	99	219	329	382	803	1,037	1,003	934	1,806	1,971

* Standard Indian bales of approximate average gross weight 400 lbs. and net weight 392 lbs. of cleaned (lint) cotton.

N.B.—The detailed statement of mill stocks on 31st August 1940 is attached.

(a) At Cawnpore.
(b) In the Punjab.
(c) In Baroda State and at Ahmedabad.
(d) In Baroda State.
(e) At Gadag.
(f) In Madras Province.
(g) In Central Provinces.
(h) In Berar.
(i) In East and West Khandesh districts.
(j) In Hyderabad State.
(k) In Indore State.
(l) In Indore and Gwalior States.
(m) At Hubli and Gadag.
(n) In Mysore State.
(o) At Gadag and Bailhongal.
(p) In Hyderabad State, and Madras Province.
(r) In Hyderabad State, Madras Province and at Bijapur.

STOCKS OF RAW COTTON HELD BY THE

(Compiled from voluntary returns

(In thousand bales*

Trade Descriptions of Cotton.	Bombay Island.	Ahmeda-bad.	Rest of Bombay Province.	Total Bombay Province.	Madras North.	Madras South.	Total Madras Province.	United Provinces.	Central Provinces.	Berar.	Total C. P. and Berar.	Bengal.	Punjab and Delhi.
BENGALS—													
U. P. Deshi	2	..	..	2	..	..	..	31	..	..	..	1	5
Punjab Deshi	3	..	2	5	..	..	..	4	..	..	..	..	17
Sind Deshi	1	..	..	1	..	..	..	..	..	..	..	..	..
Rajputana Deshi	1	..	..	1	..	..	..	..	..	..	..	..	..
Total	7	..	2	9	..	..	..	35	..	..	..	1	22
AMERICANS—													
Sind Sudhar (289-F-1)	11	4	..	15	..	3	3	..	..	..	..	..	..
Sind-(Unspecified & 4F-98)	9	..	1	10	..	8	8	..	..	..	..	..	..
Punjab-289-F	24	2	..	26	2	7	9	14	..	..	..	3	2
Punjab-L.S.S.	4	1	..	5	..	2	2	8	..	..	..	2	2
Punjab-(Unspecified-4F)	17	1	..	18	..	9	9	57	..	..	..	6	14
Buri	..	..	..	..	..	1	1	..	..	..	..	..	..
Dharwar-(Gadag 1)	1	..	1	2	..	..	..	..	..	..	..	..	..
Dharwar-(Upland-Unspecified)	1	..	1	2	..	1	1	..	..	..	..	..	..
Cambodia Co_2	..	..	..	..	..	38	38	..	..	..	..	..	..
Cambodia (Unspecified)	2	..	..	2	..	14	14	..	..	..	..	1	..
Total	69	8	3	80	2	83	85	79	..	..	..	12	18
OOMRAS—													
C. P. and Nimar Oomras	5	..	..	5	..	1	1	..	30	2	32	..	..
Berar Oomras	5	..	1	6	..	..	..	..	9	3	12	..	..
C. P. and Berar Verum	7	1	2	10	..	..	..	..	9	3	12	2	..
Khandesh Oomras	5	1	1	7	..	2	2	..	..	1	1	..	..
Khandesh Banilla	..	1	6	7	..	1	1	..	..	..	..	..	..
Barsi-Nagar Oomras	2	..	10	12	..	..	..	..	..	..	..	..	..
Hyderabad Oomras	2	..	4	6	3	..	3	..	2	..	2	..	..
Total	26	3	24	53	3	4	7	..	50	9	59	2	..
HYDERABAD GAORANI	6	..	13	19	..	..	..	..	10	..	10	..	..
CENTRAL INDIA—													
Malvi	3	..	..	3	..	1	1	2	..	..	..	..	..
Central India—Others	2	1	..	3	7	1	8	2	..	..	..	..	..
Total	5	1	..	6	7	2	9	4	..	..	..	..	..
BROACH	26	22	2	50	..	3	3	..	..	..	..	1	..
SURTI	16	21	2	39	..	..	..	..	1	..	1	..	..
DHOLLERAS—													
Gujerat-Dholleras	6	6	1	13	..	..	..	..	..	..	..	..	..
Gujerat-Short Staple	1	3	1	5	..	..	..	..	..	..	..	..	..
Kathiawar-Dholleras	2	2	..	4	..	1	1	..	..	..	..	..	..
Kathiawar-Short Staple	1	1	..	2	..	..	..	..	..	..	..	..	..
Cutch-Dholleras	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	10	12	2	24	..	1	1	..	..	..	..	..	..
SOUTHERNS—													
Kumptas Jayawant	7	..	3	10	15	3	18	..	..	..	..	..	..
Kumptas (Unspecified)	10	..	6	16	1	..	1	1	..	..	..	..	..
Bijapur and Bagalkot Jowari	1	..	8	9	..	..	..	..	..	..	..	..	..
Westerns	4	1	5	10	14	5	19	..	..	..	..	1	..
White and Red Northerns	..	1	..	1	5	1	6	..	..	..	..	..	..
Warangal and Cocanadas	..	..	2	2	..	..	..	..	..	..	..	1	..
Chinnapathi (Short staple)	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	22	2	24	48	35	9	44	1	..	..	..	2	..
TINNEVELLIES (including Karungannies)													
Tinnevellies	..	..	..	..	..	25	25	..	..	..	..	..	..
Karungannies	..	..	..	..	..	25	25	..	..	..	..	..	..
Total	..	..	..	..	..	50	50	..	..	..	..	..	..
SALEMS	..	..	..	..	..	1	1	..	..	..	..	..	..
COMILLAS	..	..	..	..	..	..	..	..	..	..	..	..	..
Total Indian Cotton	187	69	72	328	47	153	200	119	61	9	70	18	40
AMERICANS	41	4	3	48	..	1	1	..	..	..	..	2	..
EGYPTIANS	9	17	1	27	1	3	4	..	1	..	1	..	1
EAST AFRICANS	15	24	4	43	..	1	1	..	1	..	1	2	..
OTHERS (Sudan, Burma, etc.)	15	3	1	19	..	1	1	..	1	..	1	..	..
Total Foreign Cotton	80	48	9	137	1	6	7	..	3	..	3	4	1
GRAND TOTAL	267	117	81	465	48	159	207	119	64	9	73	22	41

* Standard Indian bales of approximate average gross weight 400

MILLS IN INDIA ON 31st AUGUST, 1940.

furnished by mills.)

of 400 lbs. each.)

Rest of British India.	Total British India.	Hyderabad.	Mysore.	Baroda.	Gwalior.	Indore.	Kathiawar States.	Other Indian States.	Pondicherry.	Total Indian States.	GRAND TOTAL.	Trade Descriptions of Cotton.
												BENGALS—
1	40	..	..	..	1	..	..	..	..	1	41	U. P. Deshi
..	26	..	1	..	..	..	..	..	..	1	27	Punjab Deshi
..	1	..	..	..	..	..	..	..	..	..	1	Sind Deshi
6	7	..	..	..	..	..	..	2	..	2	9	Rajputana Deshi
7	74	..	1	..	1	..	..	2	..	4	78	Total
												AMERICANS—
..	18	..	..	..	..	..	..	..	1	1	19	Sind Sudhar (289-F-1)
..	18	..	..	..	..	..	..	1	5	6	24	Sind-(Unspecified & 4F-98)
..	54	..	1	..	..	..	..	1	..	2	56	Punjab-289-F
2	21	..	..	..	1	..	..	..	..	1	22	Punjab-L. S. S.
1	105	..	..	..	6	1	..	1	..	8	113	Punjab-(Unspecified-4F)
..	1	..	..	..	..	..	..	..	..	..	1	Buri
..	2	..	1	..	..	..	..	..	..	1	3	Dharwar (Gadag 1)
..	3	..	..	..	..	..	..	..	..	..	3	Dharwar-(Upland-Unspecified)
..	38	..	1	..	..	..	..	1	..	2	40	Cambodia Cog
..	17	..	..	..	..	1	..	..	..	1	18	Cambodia (Unspecified)
3	277	..	3	..	7	2	..	4	6	22	299	Total
												OOMRAS.—
..	38	..	..	..	..	1	..	1	1	3	41	C. P. and Nimar Oomras
..	18	..	..	..	1	2	..	1	..	4	22	Berar Oomras
..	24	..	..	..	2	1	..	..	..	3	27	C. P. and Berar Verum
..	10	..	..	..	..	1	..	..	..	1	11	Khandesh Oomras
..	8	..	..	..	..	..	..	..	..	..	8	Khandesh Banilla
..	12	..	..	..	..	..	..	..	..	..	12	Barsi-Nagar Oomras
..	11	9	1	..	..	..	..	1	..	11	22	Hyderabad Oomras
..	121	9	1	..	3	5	..	3	1	22	143	Total
..	29	13	1	..	..	..	..	..	..	14	43	HYDERABAD GAORANI
												CENTRAL INDIA—
..	6	..	..	1	3	4	..	3	..	11	17	Malvi
..	13	..	..	..	1	2	..	..	..	3	16	Central India —Others
..	19	..	..	1	4	6	..	3	..	14	33	Total
..	54	1	..	5	..	1	2	..	..	9	63	BROACH
..	40	..	..	6	..	..	3	..	..	9	49	SURTI
												DHOLLERAS—
..	13	..	..	1	..	..	2	..	..	3	16	Gujerat-Dholleras
..	5	..	..	1	..	..	..	..	..	1	6	Gujerat-Short Staple
..	5	..	..	2	..	..	2	..	..	4	9	Kathiawar-Dholleras
..	2	..	..	..	..	..	..	..	..	..	2	Kathiawar-Short Staple
..	..	..	..	..	..	..	..	..	..	..	..	Cutch-Dholleras
..	25	..	..	4	..	..	4	..	..	8	33	Total
												SOUTHERNS—
..	28	..	5	..	..	..	..	..	..	5	33	Kumptas Jayawant
..	18	..	15	..	..	..	..	8	..	23	41	Kumptas (Unspecified)
..	9	..	..	..	..	..	..	..	..	..	9	Bijapur and Bagalkot Jowari
..	30	..	9	..	..	..	..	..	..	9	39	Westerns
..	7	..	5	..	..	..	..	..	..	5	12	White and Red Northerns
..	3	3	..	..	..	..	..	..	..	3	6	Warangal and Cocanadas
..	..	..	..	..	..	..	..	..	..	..	..	Chinnapathi (Short staple)
..	95	3	34	..	..	..	..	8	..	45	140	Total
												TINNEVELLIES (including Karungannies)
..	25	..	..	..	..	..	..	..	..	..	25	Tinnevellies
..	25	..	1	..	..	..	..	..	1	2	27	Karungannies
..	50	..	1	..	..	..	..	..	1	2	52	Total
..	1	..	..	..	..	..	..	..	..	..	1	SALEMS
..	..	..	..	..	..	..	..	..	..	..	..	COMILLAS
10	785	26	41	16	15	14	9	20	8	149	934	Total Indian Cotton
..	51	..	..	1	..	..	..	..	..	1	52	AMERICANS
..	33	..	1	1	..	..	..	..	..	2	35	EGYPTIANS
..	47	..	1	5	..	..	1	..	..	7	54	EAST AFRICANS
..	21	..	..	1	..	..	..	..	..	1	22	OTHERS (Sudan, Burma, etc.)
..	152	..	2	8	..	..	1	..	..	11	163	Total Foreign Cotton
10	937	26	43	24	15	14	10	20	8	160	1,097	GRAND TOTAL

lbs. and net weight 392 lbs. of cleaned (lint) cotton.

STOCKS OF INDIAN COTTON ON 31ST JANUARY, 1940, HELD BY THE MILLS AND THE TRADE IN MADRAS PROVINCE.

(In Thousand bales of 400 lbs. each.)

Trade Descriptions of Cotton.	Mill stocks on 31st January.					Trade stocks on 31st January.					Total stocks on 31st January.				
	1936.	1937.	1938.	1939.	1940.	1936.	1937.	1938.	1939.	1940.	1936.	1937.	1938.	1939.	1940.
Tinnevellies	14	28	22	32	20	12	4	18	4	2	26	32	40	36	22
Salems	6	8	15	16	4	3	2	3	8	3	9	10	18	24	7
Cambodias	41	47	46	71	33	22	11	14	17	5	63	58	60	88	38
Northerns & Westerns.	14	22	24	19	15	(a)	11	12	18	2	14	33	36	37	17
Cocanadas	†	†	†	1	1	(a)	10	12	14	8	..	10	12	15	9
Outside Cottons ..	28	34	50	27	49	(a)	..	..	..	..	28	34	50	27	49
Total ..	103	139	157	166	122	37	38	59	61	20	140	177	216	227	142

(a) Figures not collected.

† Less than 500 bales.

APPENDIX VI.

EXPORTS BY SEA OF INDIAN RAW COTTON CLASSIFIED BY VARIETIES.

(Compiled from voluntary returns furnished by exporters.)

1st September 1939 to 31st August 1940.

(In thousand bales of 400 lbs. each.)*

Trade Descriptions of Cotton.	Exported to				Total Exports.
	Europe (excluding United Kingdom) and the West.	United Kingdom.	Japan.	China and the East (excluding Japan).	
BENGALS—					
U. P. Deshi	7	5	15	—	27
Punjab Deshi	166	93	168	39	466
Sind Deshi	68	49	13	6	136
Rajputana Deshi	2	2	6	—	10
Total	243	149	202	45	639
AMERICANS—					
Sind Sudhar (289-F-1)	33	6	—	38	77
Sind—(Unspecified & 4-F-98)	7	22	5	8	42
Punjab—289-F	3	—	1	20	24
Punjab—L.S.S.	7	—	—	8	15
Punjab—(Unspecified—4-F)	33	113	87	98	331
Buri	2	—	—	—	2
Dharwar—(Gadag 1)	—	—	7	3	10
Dharwar—(Upland-Unspecified)	—	—	—	1	1
Cambodia Co.2	—	—	—	—	—
Cambodia (Unspecified)	—	—	—	4	4
Total	85	141	100	180	506
OOMRAS—					
C. P. and Nimar Oomras	11	44	10	13	78
Berar Oomras	20	9	179	47	255
C. P. and Berar Verum	—	4	4	2	10
Khandesh Oomras	7	5	127	41	180
Khandesh Banilla	—	—	4	2	6
Barsi-Nagar Oomras	3	7	65	15	90
Hyderabad Oomras	2	2	12	—	16
Total	43	71	401	120	635
HYDERABAD GAORANI	—	—	—	—	—
CENTRAL INDIA—					
Malvi	—	1	4	—	5
Central India—Others	7	1	40	24	72
Total	7	2	44	24	77
BROACH	8	11	11	50	80
SURTI	38	2	—	14	54
DHOLLERAS—					
Gujarat-Dholleras	—	—	8	9	17
Gujarat-Short staple	—	—	2	—	2
Kathiawar-Dholleras	4	1	15	5	25
Kathiawar-Short staple	11	7	11	9	38
Cutch-Dholleras	—	—	2	—	2
Total	15	8	38	23	84
SOUTHERNS—					
Kumptas Jayawant	—	—	—	5	5
Kumptas (Unspecified)	—	—	—	10	10
Bijapur and Bagalkot Jowari	—	—	2	5	7
Westerns	5	—	6	28	39
White and Red Northerns	3	—	—	3	6
Warangal and Cocanadas	3	19	—	—	22
Chinnapathi (Short staple)	—	—	—	—	—
Total	11	19	8	51	89
TINNEVELLIES(including Karungannies)					
Tinnevellies	—	—	—	8	8
Karungannies	—	1	—	6	7
Total	—	1	—	14	15
SALEMS	6	2	—	1	9
COMILLAS	14	6	—	1	21
UNCLASSIFIED	—	—	22	32	54
Total Indian Cotton	470	412	826	555	2,263

* Standard Indian bales of approximate average gross weight 400 lbs. and net weight 392 lbs. of cleaned (lint) cotton.

APPENDIX

RECEIPTS AT MILLS IN INDIA OF

(Compiled from voluntary
1st September 1939 to
(In thousand bales

Trade Descriptions of Cotton.	Bombay Island.	Ahmedabad.	Rest of Bombay Province.	Total Bombay Province.	Madras Province.	United Provinces.	C. P. & Berar.	Bengal.	Punjab and Delhi.	Rest of British India.
BENGALS—										
U. P. Deshi	6	—	1	7	1	97	—	6	35	4
Punjab Deshi	14	—	3	17	—	9	—	8	59	—
Sind Deshi	2	—	—	2	—	—	—	—	—	—
Rajputana Deshi	6	1	—	7	—	—	—	—	—	7
Total	28	1	4	33	1	106	—	14	94	11
AMERICANS—										
Sind Sudhar-(289-F-1)	41	23	1	65	6	—	—	1	—	—
Sind-(Unspecified & 4-F-98)	41	10	2	53	36	—	—	3	—	—
Punjab-289-F	82	13	2	97	22	20	—	16	4	1
Punjab-L. S. S.	6	2	—	8	5	18	—	12	2	4
Punjab-(Unspecified-4F)	49	4	1	54	22	129	—	32	72	6
Buri	1	—	—	1	—	—	—	—	—	—
Dharwar-(Gadag 1)	9	1	3	13	—	—	—	—	—	—
Dharwar-(Upland-Unspecified)	2	—	4	6	1	—	—	—	—	—
Cambodia Co.2	—	—	—	—	126	—	—	—	—	—
Cambodia (Unspecified)	4	1	—	5	48	—	1	3	—	—
Total	235	54	13	302	266	167	1	67	78	11
OOMRAS—										
C. P. and Nimar Oomras	15	—	1	16	3	1	71	5	—	—
Berar Oomras	14	1	3	18	—	—	37	2	—	—
C. P. and Berar Verum	22	3	3	28	4	—	21	6	—	—
Khandesh Oomras	18	2	3	23	4	—	—	—	—	—
Khandesh Banilla	1	3	16	20	2	—	—	—	—	—
Barsi-Nagar Oomras	8	—	37	45	—	—	—	—	—	—
Hyderabad Oomras	11	—	11	22	3	—	3	—	—	—
Total	89	9	74	172	16	1	132	13	—	—
HYDERABAD GAORANI.	27	—	31	58	—	—	19	—	—	—
CENTRAL INDIA—										
Malvi	1	4	1	6	1	10	—	—	—	—
Central India—Others	11	6	1	18	21	7	—	—	—	—
Total	12	10	2	24	22	17	—	—	—	—
BROACH	100	74	3	177	7	—	—	1	—	—
SURTI	45	74	5	124	1	—	1	—	—	—
DHOLLERAS—										
Gujerat-Dholleras	15	37	4	56	—	—	—	—	—	—
Gujerat-Short staple	6	21	1	28	—	—	—	—	—	—
Kathiawar-Dholleras	8	11	1	20	1	—	—	—	—	—
Kathiawar-Short staple	4	4	—	8	—	—	—	—	—	—
Gutch-Dholleras	—	—	—	—	—	—	—	—	—	—
Total	33	73	6	112	1	—	—	—	—	—
SOUTHERNS—										
Kumptas Jayawant	20	2	12	34	23	—	—	—	—	—
Kumptas (Unspecified)	20	2	20	42	2	1	—	—	—	—
Bijapur and Bagalkot Jowari	2	—	37	39	—	—	—	—	—	—
Westerns	24	5	6	35	27	1	—	2	—	—
White and Red Northerns	—	1	2	3	5	—	—	1	—	—
Warangal and Cocanadas	1	1	—	2	4	—	—	6	—	—
Chinnapathi (Short staple)	—	—	—	—	—	—	—	—	—	—
Total	67	11	77	155	61	2	—	9	—	—
TINNEVELLIES (including Karungannies)										
Tinnevellies	1	—	—	1	55	—	—	—	—	—
Karungannies	—	—	—	—	67	—	—	—	—	—
Total	1	—	—	1	122	—	—	—	—	—
SALEMS	—	—	—	—	5	—	—	—	—	—
COMILLAS	—	—	—	—	—	—	—	1	—	—
Total Indian Cotton	637	306	215	1,158	502	293	153	105	172	22
AMERICANS	63	7	5	75	4	—	—	6	—	—
EGYPTIANS	24	55	2	81	14	—	1	1	2	—
EAST AFRICANS	56	129	10	195	1	—	2	15	—	—
OTHERS (Sudan, Burma, etc.)	34	22	1	57	1	—	2	2	—	—
Total Foreign Cotton	177	213	18	408	20	—	5	24	2	—
GRAND TOTAL	814	519	233	1,560	522	293	158	129	174	22
Indian raw cotton consumed in mills in India. (Figures compiled mainly from returns under the Indian Cotton Cess Act—Bales of 400 lbs. net.)	634	305	233	1,172	507	350	143	101	144	45

* Standard Indian bales of approximate average gross

VII.

RAW COTTON CLASSIFIED BY VARIETIES.

returns furnished by mills.)
31*st August* 1940.
of 400 lbs. each.)

Total British India.	Hyderabad.	Mysore.	Baroda.	Gwalior.	Indore.	Kathiawar States.	Other Indian States.	Pondicherry.	Total Indian States.	GRAND TOTAL.	Trade Descriptions of Cotton.
											BENGALS—
150	—	—	—	16	—	—	1	—	17	167	U. P. Deshi
93	—	2	—	—	—	—	2	—	4	97	Punjab Deshi
2	—	—	—	—	—	—	—	—	—	2	Sind Deshi
14	—	1	—	2	2	—	9	—	14	28	Rajputana Deshi
259	—	3	—	18	2	—	12	—	35	294	Total
											AMERICANS—
72	—	—	—	—	—	—	1	1	2	74	Sind Sudhar (289-F-1)
92	—	—	—	—	—	—	3	12	15	107	Sind-(Unspecified & 4-F-98)
160	—	—	2	—	—	—	4	—	6	166	Punjab-289-F
49	—	—	—	2	1	—	1	—	4	53	Punjab-L. S. S.
315	—	1	1	27	1	—	4	3	37	352	Punjab-(Unspecified-4F)
1	—	—	—	—	—	—	—	—	—	1	Buri
13	—	1	—	—	—	—	—	—	1	14	Dharwar-(Gadag 1)
7	—	1	—	1	—	—	—	—	2	9	Dharwar-(Upland-Unspecified)
126	—	1	—	—	—	—	5	—	6	132	Cambodia Co.$_2$
57	—	—	—	—	2	—	1	—	3	60	Cambodia (Unspecified)
892	—	4	3	30	4	—	19	16	76	968	Total
											OOMRAS—
96	—	1	—	—	11	—	4	1	17	113	C. P. and Nimar Oomras
57	—	—	—	2	10	—	2	1	15	72	Berar Oomras
59	—	—	1	5	2	—	1	—	9	68	C. P. and Berar Verum
27	—	—	2	—	1	—	—	—	3	30	Khandesh Oomras
22	—	—	—	—	—	—	—	—	—	22	Khandesh *Banilla*
45	—	—	—	—	—	—	—	—	—	45	Barsi-Nagar Oomras
28	15	1	—	—	—	—	2	—	18	46	Hyderabad Oomras
334	15	2	3	7	24	—	9	2	62	396	Total
77	28	4	—	—	—	—	—	—	32	109	HYDERABAD GAORANI.
											CENTRAL INDIA—
17	—	—	5	25	54	—	15	—	99	116	Malvi
46	—	—	3	2	33	—	1	—	39	85	Central India—Others
63	—	—	8	27	87	—	16	—	138	201	Total
185	2	—	12	—	1	6	—	—	21	206	BROACH
126	—	—	20	—	—	10	—	1	31	157	SURTI
											DHOLLERAS—
56	—	—	6	—	—	5	—	—	11	67	Gujerat-Dholleras
28	—	—	1	—	1	—	2	—	4	32	Gujerat-Short staple
21	—	—	9	—	—	14	1	—	24	45	Kathiawar-Dholleras
8	—	—	1	—	—	2	—	—	3	11	Kathiawar-Short staple
—	—	—	—	—	—	—	—	—	—	—	Cutch-Dholleras
113	—	—	17	—	1	21	3	—	42	155	Total
											SOUTHERNS—
57	—	6	—	—	1	—	—	—	7	64	Kumptas Jayawant
45	—	22	1	—	—	1	12	—	36	81	Kumptas (Unspecified)
39	—	1	—	—	—	—	—	—	1	40	Bijapur and Bagalkot Jowari
65	—	17	2	—	—	1	—	1	21	86	Westerns
9	—	6	—	—	—	—	—	1	7	16	White and Red Northerns
12	7	—	—	—	—	—	—	—	7	19	Warangal and Cocanadas
—	—	—	—	—	—	—	—	—	—	—	Chinnapathi (Short staple)
227	7	52	3	—	1	2	12	2	79	306	Total
											TINNEVELLIES (including Karungannies)
56	—	—	—	—	—	—	—	—	—	56	Tinnevellies
67	—	1	—	—	—	—	3	—	4	71	Karungannies
123	—	1	—	—	—	—	3	—	4	127	Total
5	—	—	—	—	—	—	1	—	1	6	SALEMS
1	—	—	—	—	—	—	—	—	—	1	COMILLAS
2,405	52	66	66	82	120	39	75	21	521	2,926	Total Indian Cotton
85	—	—	2	—	—	—	—	—	2	87	AMERICANS
99	—	1	8	—	1	—	—	—	10	109	EGYPTIANS
213	—	3	22	—	—	4	3	—	32	245	EAST AFRICANS
62	—	—	4	—	—	—	—	—	4	66	OTHERS (Sudan, Burma, etc.)
459	—	4	36	—	1	4	3	—	48	507	Total Foreign Cotton
2,864	52	70	102	82	121	43	78	21	569	3,433	GRAND TOTAL
2,462	68	68	65	89	120	42	103	†	555	3,017	Indian raw cotton consumed in mills in India. (Figures compiled mainly from returns under the Indian Cotton Cess Act—Bales of 400 lbs. net.)

weight 400 lbs. and net weight 392 lbs. of cleaned (lint) cotton. † Included under 'Other Indian States.'

APPENDIX VIII.

Rules under "the Baroda Agricultural Produce Markets Act."

PREFACE.

Reasons for framing the rules.

In order to provide for the establishment of recognised open markets for the purchase and sale of agricultural produce in the interests of agriculturists, "The Agricultural Produce Markets Act" has been enacted and for the present it has been made applicable to Bodeli, Sankheda Taluka, Baroda District and to the Amreli Taluka. As per section 19 of this Act, these rules are framed for the management and regulation of markets. These rules, it is hoped, will be very useful to those who are concerned.

Dated 19th January 1939.

(Sd.) G. T. RANADIVE,
Superintendent.

(Sd.) S. V. MUKERJI,
SARSUBA.

Preamble.

Whereas it is expedient to provide for the regulation and management of the markets of Agricultural Produce, under section 19 of the Agricultural Produce Markets Act, it is directed under Huzur orders as follows :—

CHAPTER I.

Preliminary Rules.

Title.

1. These rules shall be called "The Agricultural Produce Market Rules."

Application.

2. According to section 2 of the Act, it is to be understood that these rules also apply to places to which the Act has been applied.

Definition.

3. In these rules, unless there is anything repugnant in the subject or context, the meaning of undermentioned words, should be taken as given below.

Broker.

I. (*a*) "Broker" means a person who having received a licence under rule 34, conducts the sale of the Agricultural Produce by charging separate *dalali* (Brokerage), and

(*b*) who does not lend money for purchases.

Act.

II. 'Act' means the "Agricultural Produce Markets Act."

Bye-laws.

III. "Byelaws" mean byelaws framed under section 20 of the Act.

Market Place.

IV. "Market Place" means the place fixed for the purchase and sale of agricultural produce by notifying it under section 5 in the State Gazette.

Vahivatdar.

V. The word "Vahivatdars" also includes "Mahalkaries."

A Dealer.

VI. (*a*) "A Dealer" is one who himself not being a broker, purchases or sells the agricultural produce, except that of his own land, himself or on behalf of others, or

(*b*) those commission agents or brokers, who purchase or sell the agricultural produce, on behalf of their clients by charging commission or brokerage.

CHAPTER II.

Constitution of the Committee, etc.

4. (1) Under sub-section 2(*b*) of the Act, the Sarsuba shall decide the number of the members that should be in the Committee on the recommendations of :— Constitution of the Committee.

(*a*) the municipality of that place,

(*b*) in absence of municipality, the District Local Board of that place, and

(*c*) Suba,

by notification in the State Gazette.

(2) According to the above sub-rule (1), the following members shall constitute the market committee ; Members of the Market Committee.

(*a*) half the number of the members elected by the growers of the agricultural produce of the area to which this Act be applied,

(*b*) one member elected by the Co-operative Societies of such area,

(*c*) one member elected by the District Local Board of such area,

(*d*) two members nominated by the Sarsuba with the sanction of the Government,

(*e*) one member elected by the municipality if in existence in such area, and if the municipality is not organised in such area, and the Village Panchayat is established, one member elected by Village Panchayat, and

(*f*) the remaining members elected by the dealers of the agricultural produce of such area.

Note.—If the number, prescribed in sub-rule (1) is odd, then to fix half the number according to sub-rule (2) (*a*), one member should be added to the fixed number and then half of the resulting total should be calculated.

(3) The Market Committee should elect one of its members as the President. President.

(4) Half of the total number of members shall form a quorum to carry out the work of the Committee. Quorum.

(5)(*a*) The term of the membership of the elected members of the market committee will be for three years. Period of the Market Committee.

(*b*) During the course of this term, if a vacancy of any member occurs due either to his

(*i*) permanently leaving the village,

(*ii*) his tendering resignation

(*iii*) his death, or

(*iv*) being declared unfit for reasons shown in rules 6 or 7, or being dismissed,

Consequence Occasion.

it will be filled up for the remaining term by a member elected by those who elected original member.

(6) The under-mentioned growers of the agricultural produce, living generally, in the talukas, in which the market place is situated, will be considered as voters to elect the member on the market committee and will be eligible for being a member of the Committee :

Voters among the growers of the Agricultural Produce.

(*a*) those possessing the Government or Barkhali land, of the assessment value of not less than Rs. 25 or which is subject to this assessment,

(*b*) the cultivator of Government land of assessment value of not less than Rs. 25,

(*c*) the cultivator of the land of the village, under direct management, of the assessment value of not less than Rs. 25 or subject to this assessment.

Exceptions.—But the below-mentioned persons shall not be considered fit :

(*a*) one who is declared a bankrupt,

(*b*) one who is punished within the State or outside by criminal magistrate for an offence under which the liable punishment is of rigorous imprisonment for more than six months,

(*c*) one who is a

(*i*) clerk or

(*ii*) servant of market committee,

(*d*) one who has a direct or indirect self interest in the committee or in the monopoly or appointments by the market committee,

(*e*) one who is mad,

(*f*) one who is less than 21 years in age.

7. The following dealers of the agricultural produce will be eligible to vote in electing a member in the market committee and to be a member on the market committee :

Voters among the dealers of agricultural produce.

(A) He who has purchased or sold in the market agricultural produce not less than 100 khandis (one khandi=20 Baroda maunds) as ascertained from the records of the market, prescribed in the byelaws and who is the leader in his own or joint Hindu family, in the year just previous to that when election is to take place,

(B) (*a*) The Chief Commission Agent, or

(*b*) if the Chief Commission Agent is unfit, his junior commission agent or servant,

of the firm or the society or the co-operative society which has purchased or sold agricultural produce not less than 100 khandis as proved from the records of market, given in byelaws, in the year previous to that when election is to take place.

(C) Any broker who has purchased or sold the agricultural produce not less than 1500 khandis as proved from the records of the market, given in byelaws, in the year previous to that when election is to take place.

Exception.—But any person specified in the above rule,

(*a*) who does not stay generally within ten miles from the limit of the market,

(*b*) who is a female,

(*c*) who is less than 21 years in age,

(*d*) who is mad,

(*e*) who is declared a bankrupt,

(*f*) who is punished within the State or outside by criminal magistrate for the offence under which the punishment liable is of rigorous imprisonment for more than six months,

(*g*) who is

(*i*) clerk or

(*ii*) servant of the market committee, or

(*h*) who has direct or indirect self interest in the committee or in the monopoly or the appointments by the market committee,

(*i*) who, being a dealer in agricultural produce, has not registered his name under section 33 of the rules,

will not be considered fit.

8. (A) Under section 5 of the Act, when the market is first notified, the Suba shall get the list of fit persons, prepared in accordance with Sections 6 and 7 of the rules,

List of voters.

(B) These persons shall be the voters from the growers as well as the sellers of the agricultural produce for the first election.

(C) At the time of the second election, after the first election, the market committee should get prepared one list of the authorised voters, from the records of the market, prescribed in byelaws and send it to Suba,

(D) The Suba should dispose of the applications showing objections against the enlisted names, or for enlisting any name or names, in this list,

(E) In this matter, the decision of the Suba will be final.

9. (1)(A) The Suba

Publication of names of voters and members.

(*a*) should publish two lists of voters in Gujarati at the well known part of the market place before first May,

(*b*) should fix a date for election upto 15th June and should publish as a notification at the well-known part of that market place.

(B) The Suba, or the officer authorised by him on paper, should make necessary arrangements

(*i*) to supervise the work of election,

(*ii*) to see whether the election is carried on systematically and

(*iii*) to publish the result of election

(C) The Suba should publish the names of elected members for the market committee in the State Gazette upto 15th July.

(2) In the list of voters, there should be,

Details in list of voters.

(*a*) the name of person,

(*b*) his father's name,

(*c*) place of residence,

(*d*) serial number of voter and

(*e*) details regarding qualification for voting as per rule 6.

Copies of list.

(3) The Suba should get prepared the required number of copies of such list and fix their prices.

Sale of copies of list.

(4) The Suba should give the copies of the list of voters to the candidates at fixed price.

The office to collect votes for electing members of co-operative societies.

10. (1) The inspector of the co-operative societies of that division will act as an officer for collecting votes of his division for electing a member on behalf of the taluka co-operative societies.

Registering name of member for election.

(2) That member of the co-operative societies, who wants to be a candidate for being a member of the market committee, should report his name to the inspector of the societies, before the date fixed by the Suba.

Sending names to Co-operative societies.

(3) The inspector should send the names, thus reported, to the co-operative societies.

Sending copy of resolution to inspector.

(4) Each co-operative society should fix as to who should be elected from the names, received from the inspector, in its meeting and pass a resolution and should send a copy of that resolution to the inspector.

Announcing result of election.

(5) The inspector after compiling the resolutions, thus received from the co-operative societies, should send a report to the Suba through the Vahivatdar for announcing the elected person getting the highest number of votes.

(6) The Suba, thus after getting the names of the member of the co-operative societies, from Vahivatdar, should publish the name of the elected person in the State Gazette. Suba to publish the name.

11. (A) The market committee shall completely supervise the market of the agricultural produce. Supervision of market committee.

(B) The market committee shall also manage and supervise the bazar roads, wells, water-troughs, and buildings, etc., of that market.

12. (A) The President of the market committee, shall give a casting vote, over and above his vote as a member, at the occasion when there are equal votes in a meeting. The vote of President.

(B) He should keep the proceedings of the meeting, signed by him.

13. The market committee should employ officers and servants as found necessary Finance of market committee.

(A) (*i*) for the management of the market and

(*ii*) for the supervision whether they behave according to the Act and Rules,

as well as

(B) should fix their pay, etc.

14. The year of the market committee shall be considered from the 1st August to 31st July. Commencement of the year.

15. The market committee The accounts of the committee.

(A) should maintain the account of the receipts and the expenditure,

(B) should get this account audited by the account-auditor appointed by it, and

(C) should publish the account each year.

16. (A) The responsibility of keeping the records and the accounts of the market-committee, regular, shall rest with the chief officer appointed by the market committee for this work. Responsibility of accounts.

(B) That officer

(*i*) should correspond in name of the committee, and

(*ii*) publish the account and report.

(C) The responsibility of the accounts kept with this officer shall also rest with him.

17. The market committee should not keep the saving of the fund in its charge as shown in sub-section (2)(*b*) of the section 12 of the Act, but should invest on interest Where to invest the saving of the fund of the market committee.

(A) in the promissory notes of Government of India, debentures and stocks,

(B) in stocks, debentures, or shares of railway or other companies, certified by the Secretary of State for India,

(C) in mortgaging the immovable property with no other debt, in Baroda State,

Note.— (*i*) The cost of property should not be less than 4/3rd of the invested capital,

(*ii*) the cost of the building, if any, should not be less than 3/2 of the invested capital.

(D) in Bank of Baroda,

(E) in any organisation of the Government for investing such amounts or which will be organised hereafter and which pay interest, or

(F) in any other way as directed by the Government occasionally.

Sanction of budget.

18. The market committee should sanction its budget every year three months before the commencement of the new year.

Powers of the market committee and control.

19. (A) The market committee, in accordance with these rules as well as the byelaws, shall use all powers, but

(B) these powers shall be controlled by the Suba.

The Suba shall appoint for helping the market committee.

20. (A) The Suba of the District shall entrust the work

(1) of supervision on dealings of the market committee, as well as

(2) of giving the necessary help, to the officer of the rank, not lower than the Vahivatdar.

(B) This officer

(1) shall supervise the dealings of the market committee,

(2) shall help the market committee when necessary and work without allowance and

(3) shall report any matter to the Suba, when needed.

The market committee should send copy of resolution to Suba.

21. The market committee should send the copy of the resolution passed by it to the Suba of the District within ten days from the date of resolution.

To fix the area, limit and time, place for carts, etc.

22. The market committee shall possess the powers

(1)(*a*) to fix the limit of the place for purchases and sales of the agricultural produce, and

(*b*) to make necessary changes occasionally,

(2) to fix time for keeping the market open and

(3) to fix the place for carting, etc. in the market,

in the limit of the market as fixed by Sarsuba under section 5 of the Act.

23. The weighment or the measure of the agricultural produce shall be carried out at a place, fixed by committee, under the supervision

Supervision on weight of produce.

(*a*) of the committee, or

(*b*) of persons employed by the committee.

24. (1) The Agricultural produce will not be measured or weighed by the scales, weights and measures unless approved by the committee.

The approval of the committee for balance, weights and measures.

(2) As given in sub-rule (1), the inspection of scales, weights and measures should be made every year by those appointed by the committee at the prescribed time.

Inspection of balance, weights and measures.

25. The register showing the trade allowance sanctioned by the market committee should be published on the notice board for the information of the sellers in the market.

Publication of trade allowance in market.

Explanation.—For the reason of this rule it should be considered that the word trade allowance also includes " brokerage."

26. (1) No more commission or deduction shall be charged than those fixed on the produce for sale and published on the notice board in the market by the market committee.

No more commission or deduction than fixed.

(2) Any

No charges for charity or tax.

(*a*) seller of produce,

(*b*) purchaser of produce,

(*c*) registered merchant,

(*d*) his servant, or

(*e*) broker

shall not take

(*i*) the amount for charity, or

(*ii*) allowances.

27. The price of the agricultural produce, which is to be sold, should be openly fixed.

To sell the produce openly.

28. (1)(*a*) The market committee or (*b*) the jury appointed by that committee shall settle the disputes

The committee to settle the disputes regarding quality of produce, weight, rate deductions, allowance, dirt, etc.

(A) between a buyer and a seller, or

(B) between their agents,

regarding

(*i*) the quality of produce,

(*ii*) weight,

(*iii*) deductions for admixture in the produce, dirt, etc.,

(*iv*) deductions, allowances, dirt particles, etc., etc., significant as well as insignificant matters, in the articles of agricultural produce.

Final decision.

(2) The settlement of disputes according to sub-rule (1) shall be considered final.

29. (1) The market committee should keep the lists

(A) (*i*) of registered merchants,

(*ii*) of licentiated brokers,

(*iii*) of the weighment and

(B) should publish its copy on the notice board of the market, and

(C) should publish the information regarding the

(*i*) removal of name of any merchant from the register, or

(*ii*) the licence of any person, if cancelled,

(*a*) for some time, or

(*b*) permanently.

on the notice board.

Not to exact work without licence.

(2) if any person will exact work, for which the market committee has issued licence, from any one possessing no licence,

Occasion.

(A) he will be subject to dismissal from the market after giving notice to that person and

Consequence.

(B) if that person possesses any licence, it will be subject to cancelling.

The market committee shall weigh with fixed rate.

30. (A) When the amount is available, the market committee shall provide big scales and balances to weigh the articles of the agricultural produce.

(B) The purchasers or sellers can get their produce, if they desire, weighed at these scales and balances, on payment of charges fixed by the committee,

Tax per cart carrying produce for sale.

31. (A) The tax fixed by the market committee per each cart, bringing the articles of agricultural produce in the market shall be recovered from those bringing the produce.

(B) Unless and until it is recovered, they will not be allowed to bring the produce.

The market committee to provide godown and frame bye-laws for rent.

32. The market committee at its convenience, should keep godown to store the agricultural produce and frame bye-rules for rent.

CHAPTER III.

Licences.

Not to sell agricultural produce unless registered as a merchant.

33. (1)(A) Any person, who has not registered his name as a merchant, shall not sell the articles of the agricultural produce on the prescribed area of that market, but

(B) it should not be considered that producer of agricultural produce is prohibited to sell the products of his own land independently.

Registration of Merchants.

(2) If any person, who does not carry out the transactions as broker after giving written agreement, applies in writing to the office of the market committee

(A) to behave according to the Act and Rules, and

(B) to pay the licence fees as prescribed in bye laws

his name will be registered as a merchant and he will be given the licence.

The duration of licence.

(3)(A) The period of the licence fees to be taken, as above, from the merchants will be from 1st August to 31st July.

(B) Every year, the licence will be renewed on payment of licence fees in this way.

Licence for brokers and weighmen.

34. (1) If any person, after giving written agreement

(A) to behave according to Act and Rules, and

(B) to pay the licence fees as prescribed in bye rules,

applies in writing to the office of the market committee to get a licence to work

(*i*) as a broker, or

(*ii*) as a weighman,

the market committee should issue the licence to work as a broker or as a weighman.

Licence fee.

(2)(A) The period of receiving the licence fees, as above, will be from 1st August to 31st July.

(B) Every year the licence will be renewed on payment of licence fees in this way before the period terminates.

To cancel the licence. Consequence.

35. (1) If the licencee disagrees with the written agreement, given to the committee as per sub-rule (2) of the rule 33 and rule 3, the committee will cancel the licence issued to him

Occasion.

(A) for some time, or

(B) permanently.

Appeal on order.

(2) The person, whose licence is cancelled according to the above subrule, will be entitled to appeal to the Suba of the district within 30 days from the date of the order.

The licence to keep accounts.

36. The person, possessing licence, subject to these rules,

(A) should keep the records of the account, etc., according to systems and styles prescribed by the market committee, occasionally and

(B) should submit them when required for audit without delay and disputes.

No person shall work without licence.

37. (A) The person possessing licence given by the market committee on payment of licence fees, or

(B) any other person except that employed by the committee,

(*i*) shall not weigh the agricultural produce in the market, or

(*ii*) shall not get the charge for any work regarding sale and purchase of the stock.

The charges for weighmen.

38. The licenciated weighmen are not entitled to take more charges than those prescribed by the committee for weighment.

The weighmen to put on belt.

39. The market committee

(A) should give a belt as prescribed in byelaws to the weighmen and

(B) he should put on the belt at the time of weighing the produce.

CHAPTER IV.

Duties.

The purchasers to give receipts to produce-sellers.

40. (1) If

(A) a merchant, or

(B) the grower of the agricultural produce sells articles of agricultural produce, the merchant, purchasing the produce,

(*i*) should give the written or printed receipt to the seller and

(*ii*) in it should describe

(*a*) the weight of the produce and

(*b*) the rate of the produce sold.

Receipt according to appendix form I.

(2) The receipt, prescribed in sub-rule (1) should be according to appendix, form I.

Penalty to those working without licence.

41. If any person

(A) will work as a broker or a weighman without licence from market-committee or

(B) will weigh the produce without putting on the belt, given by the committee,

Occasion-consequence.

he will be liable to be punished with a fine of upto Rs. 50 on confirmation of the offence.

Occasion-consequence Penalty for person working in market without licence.

42. If any person, whose licence, issued by the market committee, is cancelled, takes part in any work of selling or purchasing the produce in the market, he will be liable to be punished with a fine upto Rs. 50 for every offence.

Penalty for breach of conditions of the committee.

43. If any person

(A) (*i*) enters or

(*ii*) tries to enter,

the market at the unusual time, or

Occasion.

(B) violates the condition notified by the market committee regarding the arrangement of the cart, etc. full of produce,

Consequence.

he shall be liable to be punished with a fine, extending to Rs. 10 for every offence, on confirmation of that offence.

Dated 9th January 1939.

(Sd.) N. V. PANDIT,
N. P. ADHIKARI,

(Sd.) S. V. MUKHARJI,
Sarsuba.

FORM I.

(See Rule No. 40).

Form of Receipt.

Name of the seller and his village .....

Name of purchaser and his village .....

Name of weighman .....

Details of produce .....

Rate .....

Weight .....

Date .....

Signature of Commission agent or the purchaser.

APPENDIX IX.

Central Provinces and Berar Act No. XXXIII of 1939.

THE CENTRAL PROVINCES AND BERAR COTTON GINNING AND PRESSING FACTORIES (AMENDMENT) ACT, 1939.

[First published, after having received the assent of the Governor, in the *Central Provinces and Berar Gazette* on the 6th October 1939].

An Act further to amend the Cotton Ginning and Pressing Factories Act, 1925, in its application to the Central Provinces and Berar.

XII of 1925. Whereas it is expedient further to amend the Cotton Ginning and Pressing Factories Act, 1925, in its application to the Central Provinces and Berar, for the purpose hereinafter appearing ; Preamble.

It is hereby enacted as follows :—

1. This Act may be cited as the Central Provinces and Berar Cotton Ginning and Pressing Factories (Amendment) Act, 1939. Short title.

XII of 1925. 2. After section 2-A of the Cotton Ginning and Pressing Factories Act, 1925, the following section shall be deemed to be inserted, namely :— Insertion of section 2-B, Act XII of 1925.

" 2-B. (1) This section shall come into force from such date as the Provincial Government may, by notification, direct and shall remain in operation for a period of five years from that date. Control of rates chargeable for ginning and pressing cotton.

(2) The Provincial Government may, by notification, extend this section to any local area, and during the continuance of such notification no owner or person in charge of a cotton ginning or cotton pressing factory situate in such local area shall charge for the ginning or pressing of cotton, rates in excess of such maxima as may be fixed by the rate-fixing committee of such local area under sub-section (8).

(3) There shall be a rate-fixing committee for each local area in which a notification under sub-section (2) is in operation. Such committee shall consist of the Deputy Commissioner of the district, who shall be the chairman of the committee, and the following members, namely :—

(*a*) two representatives of cotton growers of the local area ;

(*b*) two representatives of owners of cotton ginning and cotton pressing factories in the local area ;

(*c*) one non-official possessing special or technical knowledge of cotton ginning and pressing or of cotton trade to be nominated by the Director of Industries of the province ;

(*d*) the Chief Inspector of Factories and Boilers of the province.

(4) The two representatives referred to in clause (*a*) of sub-section (3) shall be elected by cotton growers whose names are for the time being included in the voters' lists of the cotton growers' electorates formed for the constitution of market committees for the management of any cotton markets established or deemed to be established in the local area under the Central Provinces Cotton Market Act, 1932, or the same Act as applied to Berar: IX of 1932.

Provided that, if there is no such cotton market established in the local area, the said two representatives shall be selected by the District Council from amongst the cotton growers of the local area.

(5) The two representatives referred to in clause (*b*) of sub-section (3) shall be elected by the owners of cotton ginning and cotton pressing factories in the local area from amongst themselves.

(6) If the representatives of cotton growers or of owners of cotton ginning and cotton pressing factories in any local area referred to in clauses (*a*) and (*b*) of sub-section (3), are not elected or selected, as the case may be, within such time as may be prescribed, the Deputy Commissioner shall nominate such representatives from amongst the cotton growers or the owners of cotton ginning and cotton pressing factories, as the case may be, from that local area.

(7) The Provincial Government may make rules providing for and regulating the election and selection of the representatives referred to in clauses (*a*) and (*b*) of sub-section (3), the manner of election and selection, the term of office and of the members of the committee, the preparation of voters' lists, where necessary, the filling of any casual vacancies and all matters connected with such election and selection.

(8) The Provincial Government may make rules laying down the principles to be observed and the procedure to be followed by the committee in fixing the maxima rates for each season and the rates so fixed by the committee shall be duly made known by the Deputy Commissioner to all concerned in the local area before the commencement of the season in such manner as may be prescribed in the said rules.

(9) The provisions of section 13 shall apply to the making of rules under sub-sections (6), (7) and (8).

(10) Whoever contravenes the provisions of sub-section (2) shall be punishable with fine which may extend to five hundred rupees.

(11) While this section is in operation the figure and letter " 2-B " shall be deemed to be inserted after the words " for the purposes of sections " in sub-section (1) of section 7.

APPENDIX X.

Central Provinces and Berar Cotton Ginning and Pressing Rates Fixing Rules.

COMMERCE AND INDUSTRY DEPARTMENT.

Nagpur, the 4th July 1940.

No. 2072-2879-VII of 1939.—In exercise of the powers conferred by sub-sections (6), (7) and (8) of section 2-B of the Cotton Ginning and Pressing Factories Act, 1925 (XII of 1925), as inserted by the Central Provinces and Berar Cotton Ginning and Pressing Factories (Amendment) Act, 1939 (XXXIII of 1939), and of the same Act as applied to Berar, the Provincial Government is pleased to make the following rules, the same having been published as required by sub-section (2) of section 13 of the said Act :—

RULES.

1. (*a*) These rules may be cited as the Central Provinces and Berar Cotton Ginning and Pressing Rates Fixing Rules.

(*b*) They shall come into force on 1940.

2. In these rules—

(*a*) " Act " means the Cotton Ginning and Pressing Factories Act, 1925.

(*b*) " Section " means a section of the Act.

(*c*) " Season " means the period commencing on the 1st day of September in each year and terminating on the 30th day of June of the year following.

(*d*) " Form " means a form appended to these rules.

3. (*i*) As soon as an area is notified under sub-section (2) of section 2-B, the Deputy Commissioner of the district shall arrange for the election of the representatives of cotton growers and/or of owners of cotton ginning and pressing factories in the manner hereinafter prescribed.

(*ii*) The representatives of cotton growers or of owners of cotton ginning and pressing factories in any local area notified under sub-section (2) of section 2-B shall be elected or selected, as the case may be, on or before the 1st June following the date of the notification.

4. (*i*) The election of the representatives of cotton growers shall be made by inviting nomination papers in Form A and thereafter by means of polling and the manner prescribed for the election of representatives of cotton growers for the constitution of market committees for the management of any cotton markets established or deemed to be established under the Central Provinces Cotton Markets Act, 1932, or the same Act as applied to Berar as the case may be, if such cotton market or markets are established in the local area.

(*ii*) If there are more cotton markets than one established in the local area, the voters' list for the election of representatives of cotton growers shall consist of the voters'

lists for the election of representatives of cotton growers for the constitution of market committees for all such markets.

5. The election of representatives of the owners of cotton ginning and pressing factories shall be made by obtaining nominations and voting papers by post. The Deputy Commissioner shall cause to be prepared copies of the list of owners of ginning and pressing factories in the local area subject to the Factories Act, 1934, and send a copy thereof to each owner with a request to send in nominations in Form B by a fixed date. He shall thereafter issue voting papers in Form C by post to each owner who shall mark it in accordance with instructions thereon and return the same to the Deputy Commissioner on or before the date fixed by him. The scrutiny and counting of votes shall be done by an officer not below the rank of an Extra-Assistant Commissioner. The two candidates who secure the highest number of votes shall be declared elected. In the event of two or more candidates securing an equal number of votes the election shall be made by lots to be drawn by the officer who does the scrutiny and counting of votes.

6. (*i*) The term of office of the members of the rate-fixing committee shall be three years from the date of their election. Casual vacancies amongst elected or selected members of the committee caused by the death or resignation of a member or by his becoming ineligible for office shall be filled in the same manner in which the original election or selection was held. A member elected or selected to fill a casual vacancy shall hold office during the remaining term of the other members.

(*ii*) The term of office of the nominated members shall be the same as that of representatives in whose place they were nominated.

7. (*a*) The Deputy Commissioner shall make necessary arrangements for convening meetings of the rate-fixing committee.

(*b*) At least a week's notice of a meeting shall be given to the members, but failure of service of a notice on any member due to wrong address or his absence from his residing place shall not invalidate the proceedings of the committee.

(*c*) Four members of the committee shall form a quorum; provided that at least one representative of cotton growers and one of the owners of cotton ginning and pressing factories are present. No quorum shall be necessary for a meeting which was once adjourned for want of quorum, but shall be necessary to give notice of three days even for an adjourned meeting...

(*d*) All questions shall be decided by a majority of votes of the members present, and in the case of equality of votes the chairman will have a casting vote.

(*e*) The proceedings of the committee shall be recorded under the signature of the chairman in a register which shall be open for inspection by any member of the committee or owner of a cotton ginning and pressing factory in the local area.

8. In fixing the maximum rates for ginning and/or pressing of cotton the rate-fixing committee shall take into consideration the following among other factors :—

(*a*) amount of cotton to be ginned;
(*b*) ginning outturn;

(c) labour charges including management and maintenance expenses ;
(d) cost of fuel ;
(e) railway freight ;
(f) quantity of cotton crop to be handled ;
(g) cost of stores ;
(h) type of machinery in use ;
(i) municipal and other taxes ;
(j) insurance charges ;
(k) depreciation charges of machinery and building ;
(l) reasonable rate of interest not exceeding 6 per cent on the invested capital minus the accumulated depreciation fund.

9. As soon as the maximum rates for the ginning and/or pressing of cotton in any local area fixed by the rate-fixing committee the Deputy Commissioner shall communicate by registered post the rates so fixed to all owners of cotton ginning and cotton pressing factories in the local area and also publish the rates for information of the cotton growers of the area in such manner as he thinks fit.

FORM A.

Form of Nomination Paper [rule 4(i)].

(*N.B.*:—This nomination paper will not be valid unless it is sent in to the Deputy Commissioner, or other person authorized to receive it, at his office, between 11 a.m. and 3 p.m. on or before 19 .)

Name of the local area for which the candidate is nominated .. ..

Name of candidate .. ..

Father's name .. ..

Age .. ..

Address .. ..

Number of the candidate in the list of cotton growers in the local area .. ..

Name of proposer .. ..

Number of proposer in the list of cotton growers in the local area .. ..

Signature of proposer .. ..

Name of the seconder .. ..

Number of the seconder in the list of cotton growers in the local area .. ..

Signature of the seconder .. ..

Declaration of Candidate.

I hereby declare that I agree to this nomination.

Dated 19 . *Signature of Candidate*

FORM B.

Form of Nomination Paper (rule 5).

(*N.B.*—This nomination paper will not be valid unless it is sent in to the Deputy Commissioner, or other person authorized to receive it, at his office, between 11 a.m. and 3 p.m., on or before 19).

Name of the local area for which the candidate is nominated .. ..

Name of candidate .. ..

Father's name .. ..

Age .. ..

FORM C.

Form of Voting Paper (*rule* 5).

(Front of Form).

1. (Name of local area and district) ..	(Local area and district).
	Names of candidates. Cross.
	1. .. ..
2. Number of elector in the list of owners of ginning and pressing factories in the local area.	2. .. ..
	3. .. ..

(Back of Form).

No.	No.
	Instructions.
	1. You have only one vote.
	2. Put a X in the circle opposite the name of the candidate for whom you wish to vote.
	3. The words "Voting Paper" should be written on the top of the envelope containing a voting paper.

By order of the Governor,

Central Provinces and Berar,

C. C. DESAI,

Secretary to Govt., C. P. & Berar,

COMMERCE AND INDUSTRY DEPARTMENT.

APPENDIX XI.

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1940.

Administration (Central).

1.	Secretary	..Mr. D. N. Mahta, B.A., (Oxon).
2.	Assistant Secretary	..Mr. C. J. Bocarro, M.B.E., M.A.
3.	Superintendent	..Mr. Ajodhya Sahai.
4.	Assistant Superintendent ..	..Mr. A. B. Joshi, M.A., B. Com.
5.	Statistical Assistant	..Mr. M. S. Natesan, M.A.
6.	Technical Assistant	..Mr. K. Dharma Rajulu, M.Sc.
7.	Accountant	..Mr. G. D. Kharod.
8.	First Assistant	..Mr. V. F. X. Pais.
9.	Head Typist and Stenographer	..Mr. P. A. A. Durai.

TECHNOLOGICAL LABORATORY, BOMBAY.

10.	Director	..Dr. Nazir Ahmad, O.B.E., M.Sc., Ph.D. (Cantab), F. Inst. P.
11.	Senior Research Assistant (Chemist)	Mr. D. L. Sen, M.Sc. (Tech.) (Manch.), M.Sc., (Bom.), A.I.I.Sc., F.I.C.
12.	Senior Research Assistant (Physicist)	Mr. N. Hari Rao, M.Sc. (Calcutta).
13.	Senior Research Assistant (Physicist)	Mr. Ram Saran Koshal, M.Sc. (Punjab).
14.	Spinning Master	..Mr. V. V. Gupte, B.Sc. (Tech.) (Manch.), B.Sc. (Bom.).
15.	Junior Research Assistant (Microscopist)	..Mr. Amar Nath Gulati, M.Sc. (Punjab).
16.	Statistician and Personal Assistant	..Mr. V. Venkataraman, M.A. (Madras).
17.	Junior Research Assistant (Physicist)	Mr. C. Nanjundayya, M.Sc. (Calcutta).
18.	Junior Research Assistant (Physicist)	Mr. Srinagabhushana, B.Sc. (Mysore).
19.	Temporary Chemist	..Dr. L. Thoria, Dr. Ing.
20.	Head Tester	..Mr. H. B. Joshi, B.Sc.
21.	Senior Tester	..Mr. S. S. Sukthanker, L.T.C. (V.J.T.I.).
22.	Junior Tester	..Mr. G. D. Bhide, B.Sc.

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1940—*contd.*

TECHNOLOGICAL LABORATORY, BOMBAY—(*contd.*)

23.	Junior Tester	..Mr. K. V. N. Nayar.
24.	Junior Tester	..Mr. V. N. Modak, B.Sc.
25.	Junior Tester	..Mr. L. V. Sundararaman, B.A.
26.	Junior Tester	..Mr. P. S. Sambamurthy.
27.	Junior Tester	..Mr. R. G. Panvalkar, B. Sc.
28.	Junior Tester	..Mr. G. J. Kharkar, B.Sc.
29.	Junior Tester	..Mr. A. J. Farid.
30.	Junior Tester	..Mr. P. V. Nachane, B.Sc.
31.	Junior Tester	..Mr. C. S. Ramanathan, B.Sc.
32.	Junior Tester	..Mr. B. N. Prabhakar, M.Sc.
33.	Junior Tester	..Mr. K. S. Marar, B.A., LL.B.
34.	Junior Tester	..Mr. S. B. Mogre, M.Sc.
35.	Junior Tester	..Mr. P. D. Vakil.
36.	Statistical Clerk	..Mr. R. Krishna Iyer.
37.	Statistical Clerk	..Mr. P. K. Wagle.
38.	Electrician	..Mr. H. Lobo, L.E.E. (V.J.T.I.).
39.	Spinning Assistant	..Mr. N. Iyengar.
40.	Draughtsman	..Mr. B. G. Mehta.
41.	Mechanic	..Mr. J. B. Kharas.
42.	Junior Tester (Offg.)	..Mr. C. A. S. Iyer, B.Sc.
43.	Junior Tester (Offg.)	..Mr. M. Bhasker Rao.
44.	Junior Tester (Temporary) ..	..Mr. R. B. Joshi.
45.	Junior Tester (Temporary) ..	..Mr. S. Ramanathan.

INSTITUTE OF PLANT INDUSTRY, INDORE.

46.	Director	..Mr. T. R. Low, B.Sc. (Agri.) (London), I.A.S.
47.	Personal Assistant ..	..Mr. A. N. Srivastava, M.Sc. (Lucknow).
48.	Agricultural Chemist ..	..Dr. A. Sreenivasan, M.A., D.Sc. (Madras), A.I.C.

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1940—*contd.*

INSTITUTE OF PLANT INDUSTRY, INDORE—(*contd.*)

49.	Extension Officer	..Mr. Kuber Singh, B.Ag. (Bombay).
50.	Farm Superintendent and part-time Extension Officer	..Mr. S. C. Talesara, B.Ag. (Bombay).
51.	Plant Breeder	..Mr. C. P. Dutt, M.Sc. (Calif).
52.	Plant Breeding Assistant	..Mr. K. M. Simlote, B.Ag. (Nagpur).
53.	Assistant Farm Superintendent and Seed Multiplication Officer	..Mr. L. N. Desai, B.Sc. (Agra).
54.	Librarian	..Mr. B. H. Khan.
55.	Artist	..Mr. J. S. Onkar.

COTTON GENETICS RESEARCH SCHEME, INDORE.

56.	Geneticist and Botanist	..Mr. K. Ramiah, M.B.E., M.Sc., Dip. Agri. (Cantab.), L.Ag.
57.	Statistician	..Dr. V. G. Panse, B.Sc. (Bom.), Ph.D. (Lond.).
58.	Senior Botanical Assistant	..Mr. P. D. Gadkari, M.Sc. (Nagpur).
59.	Genetical Assistant	..Mr. Bholanath, M.Sc. (Punjab).
60.	2nd Botanical Assistant	..Mr. D. Ganesan, B.A., M.Sc. (Madras).

BOMBAY.

(*i*) *Broach Cotton Breeding Scheme.*

61.	Cotton Breeder	..Mr. P. L. Patel, M.Sc. (Agri.), (Iowa, U.S.A.).
62.	Botanical Assistant	..Mr. S. J. Patel, M.Ag. (Bombay).
63.	Botanical Assistant	..Mr. D. D. Gopani, B.Sc. (Agri.)

(*ii*) *Jalgaon Cotton Breeding Scheme.*

64.	Agricultural Overseer	..Mr. S. N. Deshpande, B.Sc. (Agri.) (Bombay).

(*iii*) *Scheme for Interspecific Hybridisation in Cottons at Surat.*

65.	Agricultural Overseer	..Mr. K. C. Amin, B.Ag.
66.	Agricultural Overseer and Botanical Assistant	..Mr. S. M. Patel, B.Ag.

(*iv*) *Poona Cotton Wilt Breeding Scheme.*

67.	Pathological Assistant	..Mr. J. D. Ranadive, B.Ag. (Bombay).
68.	Pathological Assistant	..Mr. Y. S. Kulkarni, B.Ag. (Bombay).

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1940—*contd.*

(*v*) *Scheme for Breeding of Wilt Resistant Cottons in Surat Area.*

69. Agricultural Overseer .. ..Mr. S. P. Shah, B.Ag. (Bombay).

(*vi*) *Scheme for Improvement of Wagad Cotton at Viramgam.*

70. Agricultural Overseer .. ..Mr. R. J. Naik, B.Ag. (Bombay).

(*vii*) *Scheme for Inclusion of Northerns and Westerns in Dry Farming Scheme at Bijapur.*

71. Agricultural Overseer .. ..Mr. B. M. Hanagodimath, B.Sc. (Agri.).

(*viii*) *Surat Seed Distribution Scheme.*

72. Cotton Assistant .. .. ..Mr. V. V. Patel, B.Ag. (Bombay).

(*ix*) *Khandesh (Jarila) Seed Distribution Scheme.*

73. Superintendent, Bhadgaon Farm ..Mr. D. B. Barve, B.Ag.

74. Cotton Superintendent, Jalgaon ..Mr. K. B. Modi, B.Ag.

75. Agricultural Overseer, Jalgaon ..Mr. S. V. Savant, B.Ag.

76. Agricultural Overseer, Jalgaon ..Mr. B. P. Joshi, B.Sc. (Agri.).

77. Agricultural Overseer, Jalgaon ..Mr. M. V. Pandit, B.Sc. (Agri.).

(*x*) *B.D. 8 Seed Distribution Scheme.*

78. Cotton Supervisor, Broach .. ..Mr. L. N. Patel, B.Ag. (Bombay).

79. Agricultural Overseer .. ..Mr. D. A. Dave, B.Ag. (Bombay).

(*xi*) *Jayawant and Gadag No. 1 Seed Distribution Scheme.*

80. Cotton Overseer, Dharwar .. ..Mr. S. M. Tippashetti, B.Ag.

81. Cotton Overseer, Bailhongal ..Mr. A. B. Hungund. B.Sc. (Agri.).

82. Cotton Overseer, Bagalkot .. ..Mr. B. S. Tadsur, B.Ag.

83. Cotton Overseer, Athani .. ..Mr. S. F. Chandrannaver, B.Ag.

84. Cotton Overseer, Gadag .. ..Mr. B. S. Patil, B.Ag.

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85. Technological Assisstant, (Dharwar). Mr. H. R. Nayak, Inter Science, (Madras).

86. Technological Assistant, (Surat) ..M. U. Parmar, M.Sc. (Bombay).

SIND.

(*i*) *Scheme for Cotton Jassid Investigation in Sind.*

87. Research Assistant .. .. ..Mr. V. G. Rajani, B.Ag. (Bombay).

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1940—*contd.*

(*ii*) *Sind Seed Distribution Scheme.*

88.	Senior Cotton Superintendent	..Mr. H. A. Idnani, B.Ag. (Bombay).
89.	Second Cotton Superintendent	..Mr. W. P. Shahani, B.Ag. (Bombay).
90.	Senior Assistant	..Mr. R. M. Ranji, Dip. Agri. (Bombay).
91.	Junior Assistant	..Mr. S. M. Khalsa, B.Ag. (Bombay).
92.	Junior Assistant	..Mr. Md. Amin Bhatti, B.Ag. (Bombay).
93.	Junior Assistant	..Mr. Sampuransing Kahan, B.Ag. (Bombay).
94.	Junior Assistant	..Mr. Lekhraj Parmanand.
95.	Junior Assistant	..Mr. K. G. Rajpur, B.Ag. (Bombay).
96.	Junior Assistant	..Mr. H. N. Bolina, B.Ag. (Bombay).
97.	Junior Assistant	..Mr. K. K. Advani, B.Ag. (Bombay).
98.	Junior Assistant	..Mr. N. S. Khemchandani, B.Ag. (Bombay).
99.	Junior Assistant	..Mr. G. H. W. Abbasi, B.Ag. (Bombay).
100.	Junior Assistant	..Mr. G. M. Advani.
101.	Junior Assistant	..Mr. Khemchand H. Sujansingani, B.Sc., Post Graduate training.

(*iii*) *Scheme for Investigation into Black Headed Cricket in Sind.*

102.	Assistant Entomologist ..	..Mr. Gobind Ram, M.Sc. (Hons.) (Punjab).
103.	Field Assistant	..Mr. Shanti Sarup.

(*iv*) *Scheme for Production of Long Staple Cottons in Sind.*

104.	Cotton Botanist	..Dr. R. Sankaran, M.A. (Madras), Ph. D. (London), D.I.C.
105.	Senior Assistant	..Mr. T. J. Chellaramani, B.Ag. (Bombay).
106.	Junior Assistant	..Mr. A. D. Hiranandani, B.Sc. (Agri.) (Texas, U.S.A.).
107.	Junior Assistant	..Mr. D. H. Bhavnani, B.Sc. (Agri.) (Bombay), M.Sc. (Agri.) (Texas, U.S.A.).

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108 Technological Assistant, (Sakrand)..Mr. S. M. Navaz, B.Sc.

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1940—*contd.*

CENTRAL PROVINCES AND BERAR.

(*i*) *Central Provinces and Berar Cotton Breeding Schemes.*

109.	Economic Botanist for Cotton	..*Mr. S. S. Pande, M.Sc.
110.	Research Officer	..Mr. S. C. Roy, L.Ag., and Post-Graduate, Pusa,
111.	Research Officer	..Mr. D. L. Janoria, L.Ag. (Hons.).
112.	Junior Research Assistant	..Mr. D. Y. Bhand, L.Ag. (Hons.).
113.	Junior Research Assistant ..	..S. L. Nema, B.Ag.
114.	Junior Research Assistant ..	..Mr. N. P. Deshmukh, B.Ag.

(*ii*) *Scheme for Extention and Marketing of V. 434 Cotton.*

115.	Agricultural Assistant ..	..Mr. G. C. Tiwari, Certificate Course of Agricultural College, Nagpur.
116.	Agricultural Assistant ..	..Mr. L. P. Khare, B.Ag.
117.	Agricultural Assistant ..	..Mr. G. N. Wardadkar, B.Ag.
118.	Agricultural Assistant ..	..Mr. M. D. Anandeo, B.Ag.
119.	Agricultural Assistant ..	..Mr. T. N. Puranik, B.Ag.
120.	Agricultural Assistant ..	..Mr. V. G. Deodhar, B.Ag.
121.	Agricultural Assistant ..	..Mr. D. R. Soman, B.Ag.

(*iii*) *Scheme for Distribution and Marketing of Buri* 107 *Cotton.*

122.	Agricultural Assistant ..	..Mr. K. S. S. Chawhan, B.Ag.
123.	Agricultural Assistant ..	..Mr. J. P. Nema, B.Ag.

(*iv*) *Scheme for Investigation of Heliothis Obsoleta.*

124.	Agricultural Assistant ..	..Mr. P. R. Roday, B.Ag.

MADRAS.

(*i*) *Pempheres Scheme.*

125.	Assistant Botanist	..Mr. G. Sheshadri Ayyangar, M.A.
126.	Assistant Botanist	..Mr. V. Ramaswami Mudaliar, B.A.
127.	Assistant Entomologist ..	..Mr. V. Margabandhu, M.A.

* Paid by the Provincial Government.

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1940—*contd.*

(*ii*) *Scheme for Investigation of Cotton Stem Weevil of South India.*

128.	Parasitologist	..Mr. P. N. Krishna Ayyar, B.A.

(*iii*) *Madras Nadam Cotton Breeding Scheme.*

129.	Assistant	..Mr. P. N. Krishnaswami Rao, B.Sc. (Ag.).

(*iv*) *Scheme for Improvement of Mungari Cotton.*

130.	Assistant	..Mr. V. K. Subramanya Mudaliar, L.Ag.

(*v*) *Scheme for Improvement of Cocanadas Cotton.*

131.	Assistant	..R. Balasubrahmanya Ayyar, B.A., B.Sc., (Ag.).

132.	Technological Assistant (Coimbatore)	Mr. R. L. N. Iyengar, M.Sc.

PUNJAB.

(*i*) *Punjab Botanical Scheme.*

133.	Cotton Research Botanist ..	..Mr. Mohammad Afzal,* B.Sc. (Agri.) (Punjab), A.I.C.T.A. (Trinidad).
134.	Assistant to Cotton Research Botanist	..Chaudhri Mohammad Akbar, L.Ag.
135.	Extra Assistant Director of Agriculture (Cotton)	..Mr. S. Sarup Singh, L.Ag., M.Sc. (Texas, U.S.A.).
136.	Agricultural Assistant ..	..S. Fateh Ali Shah, B.Sc. (Agri).
137.	Agricultural Assistant ..	..Bh. Bantasingh, B.Sc. (Agri.).
138.	Agricultural Assistant ..	..Bh. Autar Singh, B.Sc. (Agri.)
139.	Agricultural Assistant ..	..Bh. Santokh Singh, B.Sc. (Agri.).
140.	Agricultural Assistant (A Class)	..Ch. Mohammad Rashid Khan, L.C. (Course), Munshi Fazil, B.A. (Punjab University).
141.	Agricultural Assistant (A Class)	..Mr. Satya Prakash Kohli, B.Sc. (Agri.).
142.	Agricultural Assistant (B Class)	..Mr. S. E. Daniel, L.C. (Course).
143.	Agricultural Assistant (B Class)	..Mr. Sikandar Lal Sehgal, B.Sc. (Agri.).
144.	Statistical Assistant	..Mr. L. Dwarka Nath Nanda, M.A., B.Sc. (Agra).
145.	Technological Assistant (Lyallpur)	..Mr. S. Raja Raman, B.A. (Madras), M.Sc. (Benares), A. Inst. P. (London).

* Paid by Provincial Government.

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1940—*contd.*

(ii) Scheme for Improvement of Punjab-American 289F Cotton.

146.	Agricultural Assistant	..	..Ch. Kanshi Ram, B.Sc. (Agri.).

(iii) Punjab Root Rot Scheme.

147.	Assistant Cotton Mycologist		..Dr. R. S. Vasudeva, B.Sc., Ph.D. (London), D.I.C. (London).
148.	Agricultural Assistant	..	..Ch. Mohd. Ashraf, B.Sc. (Agri.).
149.	Agricultural Assistant	..	..L. Mulk Raj Sikka, B.Sc. (Agri.).

(iv) Punjab Physiological (Cotton Failure Research) Scheme.

150.	Plant Physiologist ..	..	..Prof. R. H. Dastur, M.Sc., F.L.S.
151.	Bio-Chemist ..	..	..Dr. K. M. Samant, M.Sc., Ph.D.
152.	Research Assistant ..	..	..Dr. J. J. Chinoy, M.Sc. (Bombay), Ph.D. (London), D.I.C.
153.	Agricultural Assistant	..	..Mr. Abdul Ahad, M.Sc. (Agri.).
154.	Agricultural Assistant	..	..Bh. Sucha Singh, B.Sc. (Agri.).
155.	Agricultural Assistant	..	..Bh. Mukhtar Singh, B.Sc. (Agri.).
156.	Agricultural Assistant	..	..Mr. Harmandar Lal Uppal, M. Sc. (Hons).
157.	Agricultural Assistant	..	..Bh. Amrik Singh, B. Sc. (Agri).

(v) Scheme for Cotton Jassid Investigation.

158.	Agricultural Assistant	..	..Mr. Manzur Abbas, B.Sc. (Agri.).

UNITED PROVINCES.

United Provinces Botanical Scheme.

159.	Senior Botanical Assistant	..	..Mr. B. M. Dabral, M.Sc.
160.	Senior Botanical Assistant	..	..Mr. R. M. Arora, M.Sc.
161.	Statistical Assistant ..	..	..Mr. G. K. Sant, B.Sc.
162.	Technological Assistant (Cawnpore)		Mr. S. Samson, B. Sc.

BENGAL.

Comilla Cotton Scheme.

163.	Cotton Research Officer	..	..Mr. V. N. Paranjpe, B.Sc. (Allahabad).

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1940—*contd.*

HYDERABAD STATE.

(*i*) *Hyderabad Botanical Scheme.*

164.	Cotton Research Botanist ..	..Rai Saheb Kalidas Sawhney, M.Sc. (Punjab).
165.	Assistant Cotton Research Botanist	Mr. D. V. Narayanayya, Dip. Agri. (Poona).
166.	Assistant Cotton Research Botanist	..Mr. V. K. Bederker, B.A., (Madras), B.Ag. (Bombay).
167.	Plant Breeding Assistant ..	..Mr. Mohd. Abdul Jaleel.
168.	Technological Assistant (Parbhani)	Mr. K. G. Deo, Inter Arts.

(*ii*) *Hyderabad Bollworm Clean up Scheme.*

169.	Senior Research Assistant ..	..Mr. N. T. Nadkarny, B.Ag. (Bombay), Post-Graduate Course in Entomology at Poona Agricultural College.
170.	Junior Research Assistant ..	..Mr T. E. Krishnaswamy, B.Sc. (Agri.) (Coimbatore).
171.	Junior Research Assistant ..	..Mr. Mohd. Ahsan, B.Sc., Osmania University.
172.	Junior Research Assistant ..	..Mr. V. K. Dabholkar, B.Sc. (Agri.).

(*iii*) *Scheme for Improvement of Kumpta Cotton.*

173.	Senior Research Assistant ..	..Mr. N. R. Yardi, B.Ag. (Bombay).

(*iv*) *Hyderabad Seed Distribution Scheme.*

174.	Inspector	..Mr. M. V. Chitnis.

BARODA STATE.

(*i*) *Baroda Root Rot Scheme.*

175.	Mycological Assistant ..	..Mr. G. H. Desai, B.Ag. (Bombay).
176.	Breeding Assistant	.. C. S. Krishna Iyer, B.Sc. (Agri.) (Madras).

(*ii*) *Baroda Plant Puller Propaganda Scheme.*

177.	Plant Puller Officer, Baroda Dist.	..Mr. N. K. Desai, B.Ag.
178.	Plant Puller Asstt., Baroda Dist.	..Mr. R. S. Patel.
179.	Plant Puller Officer, Navsari Dist.	..Mr. D. G. Patel, B.Ag.
180.	Plant Puller Asstt., Navsari Dist.	..Mr. R. N. Desai.

LIST OF SCIENTIFIC, TECHNICAL & OTHER OFFICERS PAID FROM THE INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON AUGUST 31ST, 1940—*concld.*

(iii) Baroda B.D. & Seed Distribution Scheme.

181. Cotton Officer, Propaganda Work ..Mr. K. C. Patwa, B.Ag., F.R.H.S.

(iv) Dholleras Cotton Improvement Scheme.

182. Assistant Cotton Breeder, Amreli ..Mr. A. F. Patel, B.Ag., (Bombay).

183. Breeding Assistant, Jagudan ...Mr. R. T. Jog, M.Sc., (Bombay).

BIKANER STATE.

Bikaner Bengals Cotton Improvement Scheme.

184. Cotton Assistant .. .. ..Mr. Arjan Singh, B.Sc.

MYSORE STATE.

Mysore (Doddahathi) Scheme.

185. Junior Assistant Botanist, in charge of Field operations at Irwin Canal Farm, Mandya .. .. ..Mr. G. Srinivasa Iyengar, M.Sc., (Mysore).

186. Sub-Assistant Botanist in charge of Laboratory investigations at Bangalore and Fieldwork at Hebbal Farm. .. .. ..Mr. S. G. Narasimhachar, M.Sc., (Mysore).

APPENDIX XII.

LIST OF RESEARCH STUDENTS OF THE INDIAN CENTRAL COTTON COMMITTEE.

Serial No.	Year of grant of scholarship.	Name.	Subject.	Place of training.	How now employed.
1	1923	Sohan Singh Bindra, M.Sc. Honours School (Punjab).	Cotton Entomology ..	Lyallpur	....
2	,,	Mohammad Afzal, B.Sc. (Punjab).	Cotton Botany (Plant Breeding.)	Do.	Punjab Agricultural Dept., Cotton Research Botanist, Botanical Research Scheme.
3	,,	Sheo Shanker Pande, M.Sc. (Punjab).	Do. ..	Nagpur	Temporary Economic Botanist for Cotton, Central Provinces & Berar.
4	,,	Jiwan Singh, M.Sc. (Punjab) ..	Cotton Mycology ..	Do.	Reader in Botany, Khalsa College, Amritsar.
5	,,	Ilabanto Banerji, M.Sc. (Calcutta).	Cotton Botany ..	Coimbatore	University Lecturer in Botany, Calcutta University.
6	,,	B. B. Desai, B.Ag. (Bombay) ..	Do. ..	Dharwar	Sind Agricultural Dept. Deputy Director of Agriculture, Left Bank, Hyderabad, Sind.
7	1924	Atul Chandra Dutta, M.Sc. (Calcutta).	Do. ..	Coimbatore ..	Lecturer in Botany, Cotton College, Gauhati, Assam.
8	,,	N. Hari Rao, M.Sc. (Calcutta) ..	Textile Physics ..	Technological Research Laboratory, Matunga, Bombay.	Senior Research Assistant (Physicist), Technological Research Laboratory, Matunga, Bombay.
9	,,	H. D. Nangpal, M.Sc. Honours School (Punjab).	Cotton Entomology ..	Cawnpore ..	....

LIST OF RESEARCH STUDENTS OF THE INDIAN CENTRAL COTTON COMMITTEE.—*contd.*

Serial No.	Year of grant of scholarship.	Name.	Subject.	Place of training.	How now employed.
10	1924	Sant Bahadur Singh, M.Sc. (Benares Hindu University).	Cotton Physiology ..	Surat	....
11	1925	Viswa Ram Singh, M.Sc., (Benares Hindu University).	Cotton Entomology	Cawnpore	United Provinces Agricultural Department.
12	,,	Akbar Ali, B.Sc. (Punjab) ..	Cotton Botany (Plant Breeding).	Lyallpur	Punjab Agricultural Department.
13	,,	Kidar Nath Trehan, M.Sc. (Punjab.)	Cotton Entomology..	Do.	Punjab Agricultural Dept.
14	,,	S. E. Kumana, B.A., M.Sc. (Bombay).	Cotton Technology ..	Technological Research Laboratory, Matunga, Bombay.	....
15	,,	J. D. Ranadive, B.Ag. (Bombay)	Cotton Mycology ..	Dharwar	Pathological Assistant, Cotton Wilt Breeding Scheme, Poona.
16	,,	P. K. Roy, M.Sc. (Dacca) ..	Textile Physics ..	Technological Research Laboratory, Matunga, Bombay.	....
17	,,	K. R. Sen, M.Sc. (Dacca) ..	Textile Physics ..	Technological Research Laboratory, Matunga, Bombay.	Senior Research Physicist, Indian Central Jute, Committee.
18	,,	L. N. Rao, M.Sc., (Calcutta) ..	Cotton Microscopy ..	Do.	Lecturer in Botany, Central College, Bangalore.
19	1926	D. F. Kapadia, B.A. (Bombay), M.Sc. (Tech.) (Manchester).	Cotton Technology ..	Do.	Head of the Textile Manufactures Dept., Victoria Jubilee Technical Institute, Bombay.

LIST OF RESEARCH STUDENTS OF THE INDIAN CENTRAL COTTON COMMITTEE.—*contd.*

Serial No.	Year of grant of scholarship.	Name.	Subject.	Place of training.	How now employed.
20	1926	Ram Saran Koshal, M.Sc., (Punjab).	Textile Physics ..	Technological Research Laboratory, Matunga, Bombay.	Senior Research Assistant (Physicist), Technological Research Laboratory, Matunga, Bombay.
21	,,	M. A. Shama Iyengar, B.Ag. (Bombay).	Cotton Physiology ..	Surat	Sind Agricultural Dept., Senior Assistant to Agricultural Chemist and Soil Physicist, Sakrand.
22	,,	Karam Singh Lamba, B.Sc., Honours School (Punjab).	Cotton Entomology ..	Lyallpur	....
23	,,	Y. D. Wad, M.A., M.Sc. (Bombay), A. I. I. Sc.	Cotton Bio-chemistry.	Coimbatore	....
24	,,	H. A. Idnani, B.Ag. (Bombay)..	Cotton Botany ..	Institute of Plant Industry, Indore.	Sind Agricultural Dept., Senior Cotton Supt., Sind Seed Distribution Scheme, Dadu.
25	,,	S. C. Talesara, B.Ag., (Bombay)..	Cotton Botany.. ..	Do.	Asst. Farm Supdt., and part time Extension Officer, Institute of Plant Industry, Indore.
26	1927	R. Lakshminarayana Iyengar, M.Sc.	Cotton Technology ..	Technological Research Laboratory, Matunga, Bombay.	Technological Assistant, Coimbatore.
27	,,	Anant Krishna Thakur, M.Sc. (Bombay).	Cotton Biochemistry	Institute of Plant Industry, Indore.	Asst. Chemist, Indian Lac Research Association.
28	,,	Dev Raj Mehta, B.Sc., Hons. School (Punjab).	Cotton Entomology ..	Lyallpur	Entomologist, Punjab Department of Public Health.

LIST OF RESEARCH STUDENTS OF THE INDIAN CENTRAL COTTON COMMITTEE.—*contd.*

Serial No.	Year of grant of scholarship.	Name.	Subject.	Place of training.	How now employed.
29	1927	Uma Shanker, M.Sc., (Allahabad).	Cotton Entomology ..	Cawnpore	Asst. Professor of Entomology, Agri. College, Cawnpore.
30	,,	Shripad Shamrao Rane, M.Sc. (Benares Hindu University.)	Cotton Physiology ..	Institute of Plant Industry, Indore.	....
31	,,	Sant Singh Verma, M.Sc. (Benares Hindu University).	Cotton Physiology in connection with Cotton Wilt Investigation.	Dharwar	....
32	,,	Lakshmi Narayan Mathur, M.Sc. (Punjab).	Cotton Breeding ..	Institute of Plant Industry, Indore.	Crop Botanist, Ujjain, Gwalior Dept. of Agriculture.
33	,,	Kadaba Rangasamy, M.Sc. (Calcutta).	Cotton Breeding ..	Coimbatore	....
34	,,	S. Shamser Singh, M.Sc., (Punjab).	Cotton Agronomy ..	Institute of Plant Industry, Indore.	Agricultural Officer, Bikaner State.
35	1928	K. Dharmarajulu, M.Sc., (Bombay).	Cotton Mycology ..	Dharwar	Technical Assistant, Indian Central Cotton Committee, Bombay.
36	,,	Piare Mohan, B.Sc., Honours School (Punjab), M.Sc.	Cotton Entomology ..	Cawnpore	Assistant Entomologist under the Plant Pathologist, Poona.
37	,,	R. N. Gidwani, B.Ag. (Bombay)	Cotton Agronomy ..	Surat	Sind Agri. Depart., Marketing Officer, Special Crops Group.
38	,,	M. Kanti Raj, M.A., B.Sc. (Agri.) (University of Edinburgh).	Do.	Institute of Plant Industry, Indore.	Madras Agricultural Service, Supdt. Agricultural Research Station, Anakapalle.

LIST OF RESEARCH STUDENTS OF THE INDIAN CENTRAL COTTON COMMITTEE—*contd.*

Serial No.	Year of grant of scholarship.	Name.	Subject.	Place of training.	How now employed.
39	1928	C. Nanjundayya, M.Sc., (Calcutta).	Cotton Technology ..	Technological Research Laboratory, Matunga, Bombay.	Junior Research Assistant (Physicist), Technological Research Laboratory, Matunga, Bombay.
40	1929	Srinagabhushana, B.Sc.	Do. ..	Do. ..	Junior Research Assistant, Technological Research Laboratory, Matunga, Bombay.
41	,,	Bhai Pratap Singh Bhullar, B.Sc. (Agri.) (Punjab).	Cotton Marketing and Economics.	Lyallpur	Punjab Agriculture Dept.
42	,,	Bhai Ajaib Singh Gulzar, B.Sc. (Agri.) (Punjab).	Do. ..	Do. ..	Punjab Agriculture Dept.
43	1930	Madan Lal Bhatia, M.Sc. (Punjab.)	Cotton Entomology ..	Do. ..	....
44	,,	Bhola Nath, M.Sc. (Punjab) ..	Cytology and Plant Breeding.	Institute of Plant Industry, Indore.	Genetical Assistant, Cotton Genetics Research scheme, Indore.
45	,,	Pran Nath Mehra, M.Sc. (Punjab).	Do. ..	Sakrand	....
46	,,	Brajendra Nath Bhargava, M.A. (Lucknow).	Cotton Marketing and Economics. ..	Lucknow	
47	1931	B. S. Sheshgiri, B.Ag. (Bombay).	Do. ..	Surat	....
48	,,	K. R. Dube, B.Ag. (Nagpur) ..	Do. ..	Nagpur	....
49	,,	Santokh Singh Jaggi, B.Sc. (Agri.) (Punjab).	Do. ..	Lyallpur	Agricultural Asst., Punjab Botanical Research Scheme.
50	,,	Doraiswami Ayyar, B.A., B.Sc. (Agri.) (Madras).	Do. ..	Madras	Madras Agricultural Department.

Serial No.	Year of grant of scholarship.	Name.	Subject.	Place of training.	How now employed.
51	1935	Krishna Behari Lal, M.Sc. (Cal.), Ph.D. (Edinburgh).	Cotton Entomology ..	Lyallpur	Second Assistant Entomologist at the Imperial Agricultural Research Institute, New Delhi.
52	1936	M. U. Parmar, M.Sc., (Bombay).	Cotton Technology ..	Technological Research Laboratory, Matunga, Bombay.	Technological Assistant, Surat.
53	,,	G. Rama Rau, B.Sc. (Bombay) ..	Do. ..	Do. ..	....
54	1931	Sant Singh Verma, M.Sc. (Benares Hindu University) ..	Plant Physiology ..	Imperial College of Science and Technology, London.	....
55	1933	S. N. Venkataramanan, B.A., B.Sc. (Agri.) (Madras).	Cotton Statistics ..	Calcutta	Madras Agricultural Department.
56	,,	C. Jagannatha Rao, B.A. (Madras)	Cotton Physiology ..	Madras	Madras Agricultural Department.
57	1936	P. Abraham, B.A., (Madras) ..	Cotton Cytology ..	Coimbatore	Asstt. to the Cotton Specialist, Coimbatore.
58	1933	M. Taskhir Ahmad, B.Sc. (Agri.) (Punjab.)	Cotton Entomology ..	Trinity College, Cambridge.	Assistant to Entomologist, Imperial Agri. Research Inst., New Delhi.
59	1933	G. B. Patel, B.Ag. (Bombay) ..	Cotton Breeding ..	University of California, U. S. A.	Bombay Agricultural Service.
60	1934	M. A. Shama Iyengar, B.Ag. (Bombay.)	Study of kalar (alkali) lands and cultivation of superior Egyptian cottons with special reference to soil and environmental conditions.	Tour in Hungary, England and Egypt.	Sind Agricultural Dept., Senior Asst. to Agricultural Chemist and Soil Physicist.

LIST OF RESEARCH STUDENTS OF THE INDIAN CENTRAL COTTON COMMITTEE—*concld.*

Serial No.	Year of grant of scholarship.	Name.	Subject.	Place of training.	How now employed.
61	1934	Nazir Ahmad, M.Sc. (Punjab) ..	Cotton Entomology ..	Imperial College of Science and Technology, London.	....
62	1936	Kidar Nath Trehan, M.Sc., (Punjab).	Applied Entomology ..	Rothamsted Expt. Station.	Punjab Agri. Cultural Department.
63	1938	V. G. Panse, B.Sc.	Statistics	Rothamsted Expt. Station and London University.	Statistician, Cotton Genetics Research Scheme, Indore.
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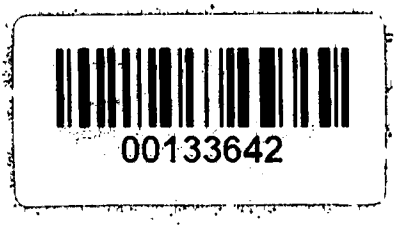
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